Ex-libris
Charles Atwood
Kofoid
BMC

THE LIBRARY
OF
THE UNIVERSITY
OF CALIFORNIA

PRESENTED BY
PROF. CHARLES A. KOFOID AND
MRS. PRUDENCE W. KOFOID

WITH THE WORLD'S GREAT TRAVELLERS

Digitized by the Internet Archive
in 2008 with funding from
Microsoft Corporation

http://www.archive.org/details/withworldsgreatt00morrrich

BOSTON COMMON, BOSTON, MASS.

SPECIAL EDITION

WITH THE WORLD'S GREAT TRAVELLERS

EDITED BY CHARLES MORRIS
AND OLIVER H. G. LEIGH

VOL. II

CHICAGO
UNION BOOK COMPANY
1901

Copyright 1896 and 1897
by
J. B. Lippincott Company

Copyright 1901
E. R. DuMont

G170
M68
v.2

CONTENTS.

SUBJECT.	AUTHOR.	PAGE
New York, Washington, Chicago	Oliver H. G. Leigh	5
Winnipeg Lake and River	W. F. Butler	21
A Fine Scenic Route	Henry T. Finck	31
South Pass and Fremont's Park	John C. Fremont	42
In the Yellowstone Park	Ferdinand V. Hayden	49
The Country of the Cliff-Dwellers	Alfred Terry Bacon	58
Lake Tahoe and the Big Trees	A. H. Tevis	68
The Chinese Quarter in San Francisco	Helen Hunt Jackson	78
Mariposa Grove and Yosemite Valley	Charles Loring Brace	88
A Sportsman's Experience in Mexico	Sir Rose Lambert Price	99
The Scenery of the Mexican Lowlands	Felix L. Oswald	108
Among the Ruins of Yucatan	John L. Stephens	119
The Route of the Nicaragua Canal	Julius Froebel	130
The Destruction of San Salvador	Carl Scherzer	137
Scenes in Trinidad and Jamaica	James Anthony Froude	145
The High Woods of Trinidad	Charles Kingsley	157
Animals of British Guiana	C. Barrington Brown	169
Life and Scenery in Venezuela	Alexander von Humboldt	179
The Llaneros of Venezuela	Ramon Paez	190
The Forests of the Amazon and Madeira Rivers	Franz Keller	200
Canoe- and Camp-Life on the Madeira	Franz Keller	212
Besieged by Peccaries	James W. Wells	219
The Perils of Travel	Ida Pfeiffer	232
Brazilian Ants and Monkeys	Henry W. Bates	240
The Monarchs of the Andes	James Orton	251
Inca High-Roads and Bridges	E. George Squier	261

M311759

List of Illustrations

VOLUME II

Boston Common, Boston, Mass. - - - - *Frontispiece*

Pennsylvania Avenue, Washington - - - - 14

Memorial Monument to Samuel de Champlain, Founder of Quebec - - - - - - - - 34

The Upper Yellowstone Falls - - - - 50

Grand Cañon, Arizona - - - - - - - 66

Red Wood Tree, California - - - - 96

Regina Angelorum (Queen of the Angels) - - - 116

A Waterfall in the Tropics - - - - - 146

La Guayra, Venezuela - - - - - - 180

A South Sea Island - - - - - - 214

The Monarchs of the Andes - - - - - 252

WITH THE WORLD'S GREAT TRAVELLERS.

THE WORLD'S GREAT CAPITALS OF TO-DAY.

OLIVER H. G. LEIGH.

New York, Washington, Chicago.

The reflective voyager, on his first sight of New York, is baffled when he attempts to catalogue his sensations. All is so completely in contrast with the capitals of Europe. The gloriously bright sky, air that drinks like champagne, the resultant springiness of life and movement, that overdoes itself in excitement and premature exhaustion, and the obtrusively visible defects of this surface enthusiasm, monotonous streets, unfinished or unbegun city improvements, and the conspicuous lack of play-spaces for children—this is the rough portrait sketch New York draws of itself for the newcomer. It does not disguise the fact that money-making was for many years the dominant consideration. The city was laid out for business, and public comfort had to look out for itself. The workers, the poor, and the helpless were apparently overlooked.

But there are at least three New Yorks to explore. Old New York stretches from the bay up to once aristocratic Madison Square, and this is the section that first leaves its mark on the aforesaid visitor. Then comes new New York, the splendid modern metropolis that spreads from Central Park along the Hudson to the north-

ern heights where the stately mausoleum of Grant, the transplanted Columbia University, and the great Cathedral-to-be add majestic dignity to the grandly picturesque panorama by the river. The antiquated brownstone wilderness of fashionable houses blossoms into white and gray and red clusters of mansions, richly varied in form and treatment, with the welcome grassy settings so pitifully missing in the older quarter. From a neglected span of prairie ground, pimpled with bare rocks and goat-sheltering shanties also shared by dago families, this section has in a few years qualified itself to rival the famous features of old-world cities. A nobler prospect than Riverside Drive alongside the mighty Hudson cannot be desired nor found. At last the city has discovered and worthily utilized its splendid opportunities. Then, thirdly, there is Greater New York. For the simplification of local government it is doubtless excellent policy for London and New York to lasso their humbler neighbor towns that the big cities may pose as suddenly greater than ever. The thing is done with a stroke of the pen and does not wound the pride of the newly scooped-in citizens, because the individuality of the suburban districts remains unchanged, but in our infantile capacity as mere sightseers the side-shows do not affect the glories of the ring proper. If this fashion of acquiring greatness continues, being inclusion rather than expansion, there need be no limit to the ciphers periodically tacked on to the population of the world's swarming hives. Now that New York is growing, it might drop its insignificant borrowed name and assume its rightful one of dignity and historic import, Manhattan. It fills the twenty-two square miles between Harlem river, the Hudson, the East River, and the bay, which area is Manhattan Island. North of the Harlem it includes the district of

the Bronx, a little stream which for half a mile or so affords as exquisite a picture of nature's beauty as can be found anywhere. The drift from town to country homes is a sign of the times and an augury of great good to the coming generation, physical and patriotic. After all, bricks and mortar are not the making of a city. New York is at its best beyond the borders. Its rich citizens overflow into these northern suburbs and lordly estates, and across the East River into Brooklyn and Long Island's garden villages, and across the Hudson into New Jersey's charming towns, and down the bay to Staten Island. In no great metropolis this side of Constantinople is it so easy and inexpensive to slip quickly from the office or home and enjoy the bracing delights of a sail down the salt water (the upper bay has fourteen square miles and the lower over eighty) or up a stately river with all the charms of the Hudson. Everything is on the grand scale, once the city's square blocks of barracky houses are left behind.

Old-world quietists are surprised to discover one cosy quarter, perhaps two, in the grimy section of New York. Stuyvesant Square and its immediate belongings around St. George's Church still survive as an oasis of sweetness and light in a wilderness of dismal commonplace. Washington Square carries somewhat of the old aristocratic flavor to the borders of Bohemia, and the Theological College in Chelsea used to give a solemnizing leaven to that changing district. The social transformation is still in progress. It may, perhaps, be a token of the rise to metropolitanism that the distinctively American hotels of the old-fashioned type have virtually disappeared. European models have the preference for the time being in the in- and outdoor life of New Yorkers. English sports have apparently taken firm root, as seen in the

popularity of golf, football, horse-racing, rowing, and some less desirable practices incident to one or two of these erstwhile sports that have developed into business undertakings, to the regret of true sportsmen. In this connection it is worth while to notice the striking disparity in the sizes of the audiences and outdoor crowds of New York and London. If fifteen thousand people pay to see the Harvard-Yale football game, or other such sport, it is considered worthy of special headlines in the papers. Madison Square Garden holds that number, seated, but the occasions when it has been filled at meetings have been few. Football crowds in England range from thirty up to seventy thousand, by turnstile record. The Crystal Palace accommodates over one hundred thousand holiday-makers without being crowded, in its central nave, sixteen hundred feet by eighty, besides transepts, and its famous grounds. The late Rev. C. H. Spurgeon had congregations of six thousand, seated, twice each Sunday for twenty-eight years. Mr. Gladstone and others have addressed twenty-five thousand in the Agricultural Hall, which covers over three acres, and St. Paul's Cathedral has occasional congregations of over twenty thousand. These facts are the more curious as applying to a small country.

One explanation of this contrast lies in the fact that New York is not a homogeneous community. In a more marked degree than other capitals it is a congeries of towns and colonies, largely alien in sympathies. You can wander in turn through Judea, China, Italy, Ireland, France, Russia, Poland, Germany, Holland, and colored colonies. Local color is strong in each. The English speech is not used, not known, by many of these people. The picturesqueness of tenement life and its Babel sounds does not atone for the want of the deep-rooted Americanism

which must sooner or later be the test of welcome immigration.

Broadway is one of the great streets of the world though really a Narrow-way for so important a thoroughfare. Running north and south and having no rival for its most used section it has more than its natural share of traffic. From the historic Bowling Green and Trinity Church—two fine monuments of pre-Revolution days—up to Fourteenth Street, Broadway is mainly a wholesale market. Then it changes to a retail bazaar, and its trading features disappear as it nears the park. There used to be a well-defined sky-line in the lower city, but this has been sadly damaged by the towering office Babels that make the older quarter of the city a cave of the winds. If some day an earthquake were to shake the lower end of Manhattan Island, mighty would be the fall of these presumptuous files and woe betide their inhabitants. Fifth Avenue up to Thirty-fourth Street has given up its fashionable prestige in exchange for the profits of business. The Stock and Produce Exchanges are far down-town, among the multitude of banks that crowd around the spot made sacred ground to future generations of patriots as the scene of Washington's inauguration as President. The city and its environs are rich in historic sites and monuments of the Revolutionary struggle. These, happily for the country's future, are every year being sought and studied by the young, also by bands of teachers from states near and far, and by visitors from abroad. The devotion of one or more societies of private individuals has of late years conferred a boon upon the public which can hardly be too highly appreciated, in causing durable memorial tablets to be placed on buildings of historic interest. In this and kindred ways New York is fast removing all

justification for the stale reproach that it cared not for shrines and took small interest in its own history.

A mere suggestion, yet a very helpful one, toward realizing somewhat of the enormous shipping business done for the country by New York can be got by a tour of the main wharves. There is a water-front of twenty-five miles around the island, without reckoning the shores of Brooklyn and Hoboken. The bird's-eye view from the wonderful and graceful Suspension Bridge enlarges one's conception of what such a metropolis is and can do. Alpine grain elevators circle the city on the opposite shore of the rivers and upper bay. Two thousand ships sail out each year laden with the grain that feeds the nations on the other hemisphere. Three thousand steamships enter these wharves yearly with human and commercial freight from foreign ports. Nearly ten thousand steerage immigrants land each week the year round, besides an immense passenger contingent. These are the sights that fascinate the thoughtful: the comings and goings of the peoples of the earth and its products. Old Castle Garden and the Battery have greatly changed in recent years, but their memories linger. If it had been possible to keep the triangle south of Fourteenth Street as the select residential quarter, what an unrivalled site it would now be! A water panorama worth crossing the Atlantic to see, for its immensity, its picturesque bordering, and the magnificent view of the foreground of an embowered city by the sea.

Human needs shaped these water avenues to other destinies. They draw from the great ocean beyond the Narrows the sources of all that has gone to the building of national greatness. In turn they have borne to other lands the seeds of a larger liberty, patterned after and stimulated by the unparalleled success that has so splen-

didly rewarded self-achieved freedom to grow, to think, to speak out, and to speed the commerce of the world.

The wealth thus created has of recent years done much to beautify the city with palatial residences. In the northern districts detached mansions in grass-plots supersede the monotonous brownstone rows. Many of these vie with each other in the extent and delicacy of decorative carvings outside. Others are fashioned after the castellated structures of Europe. The general impression left by a town of the newer fashion quarter is that Jeffersonian simplicity, in architecture at least, is no longer to be understood as synonymous with severe plainness. Probably no other city can point to an equally rapid transition from conventional taste, excellent for its period, to the present enthusiasm for the best in artistic construction, whatever its cost.

The bicycle proved a revolutionizer of dress as well as a stimulus to outdoor exercise. Each nation learns from the others and so we progress, though there is possible weakness in the tendency toward rigid uniformity. The picturesque and the primitive are disappearing in every land. National individuality should not lightly be allowed to lapse, even in minor matters of costume and recreation.

Experienced travellers know that a country is not to be judged by its metropolis. There is a sturdier back-bone of conservatism in the provinces than in the great cities, so largely made up of aliens and sojourners. A goodly proportion of the business men whose genius has made New York what it is, and who are admittedly qualifying it soon to become the financial centre of the world, are country-born and raised. Great as New York is, and mightier as it will become by reason of its situation, the true and abiding greatness of the nation is spread over

the thousand cities and towns that equally represent American pluck and stability. In the farming districts and the scattered rural communities, in vast agricultural areas of which city people take too little note, and in the steady, plodding, smaller towns, there abides a calm but potent force that throbs with high patriotism, and will prove an all-sufficient strength in time of peril.

Washington! Its very name an inspiration, its every feature a fascination to the lover of his country who makes his first pilgrimage to the national shrine. Other great cities bear the glorious marks of the tribulations and triumphs they suffered and enjoyed as they passed through their historic experiences. Here is a capital created as the consummation of a people's release from thralldom. A new city, invented as the proclamation of a new nation's advent, the symbol and promise of a mightier world-power than its proudest founders ever conceived possible in their highest enthusiasms. The youngest of famous capitals, it already holds its own with the best of its kind for grandeur and the *rus in urbe* charm. Its spacious avenues, one hundred and sixty feet wide, are lined with trees and grassy walks. Their stately sweep gives chances for fine landscape effects, which are finely used. The vistas of the grand avenues are bounded by some piece of memorial statuary or an imposing structure in the distance, as is Pennsylvania avenue by the incomparable Capitol. No national monument is better known throughout the world than this noble edifice. Its majestic stateliness is enhanced by its snowy whiteness.

The Capitol is the greatest building for its purposes in the United States. It covers three acres and a half, and has a frontage of seven hundred and fifty feet. The great dome, with its figure of Liberty, reaches a height

of over three hundred and seven feet. Standing on the rising ground among the rich foliage it has an aspect of quiet strength, an impressive assurance of dignity and permanence peculiar to itself among massive buildings in the great cities. Everyone goes, or should go, to see Congress at work, and to explore the corridors trod by generations of the nation's legislators, soldiers, jurists, orators, in short, by all the great makers of the nation since Washington laid its foundation stone. A singular instance of fate thwarting intention is found in the situation of the Capitol. It was planned to face eastward, the White House was to be in the rear, and the city was expected to spread away from the river, eastwardly. But it perversely grew to the northwest, with the result that the Capitol turns its back on the capital. No one would suppose this is so unless told, so splendidly balanced in architectural dignity are both fronts of the edifice. Another peculiarity is that the head city of the republic is monarchically governed, and governed better than any other city in the Union. Three commissioners are appointed by the President, and the citizens have no political franchise. The city was planned as a grand example of what a capital should be. Impressed by the lessons of the revolutions in Paris the designer dotted the area with circular grass-plots or miniature parks, from which avenues and streets radiate like wheel-spokes. In case of need a gun in each of the circles could command an enemy approaching from any quarter. The peaceful use of these charming sites is more befitting the spirit of the republic. Statues of its soldier-heroes who saved the Union adorn each circle and give historic interest to the vistas. There are two hundred miles of streets. In summer-time they are groves of rich foliage. They and the park spaces

take up half the area of the city. It is wisely intended to re-name the principal streets after famous American patriots instead of alphabetically.

Washington is pre-eminently a city of "sights." The great government buildings are distributed over the city with excellent effect. They are noble edifices, worthy of the Capitol and the capital. The Treasury, with its never-to-be-forgotten scenes inside, the Army and Navy offices, the Smithsonian Institution, and the rest of the head-quarters of national business need no further mention here. The Corcoran Art Gallery, the Patent Office, and the new Library of Congress demand a special word. The latter is one of the most exquisite buildings in the world, with interior decorative treatment quite beyond anything hitherto known in the country. Its brilliant dome does not suffer by proximity to the Capitol. An inspection of the Patent Office is a revelation of genius peculiarly American, and its display throws the clearest light on the secret of the country's amazing material prosperity. A visit to Washington ought to be the finishing touch to the schooling of every girl and boy. Historic sites and shrines appeal to the mature mind, but the show places of the capital peculiarly suit the youthful instinct for the novel and striking in matters of fact.

To see the Senate and House of Representatives in session is a high privilege for any citizen, yet it is hampered by few, if any, such restrictions as are imposed in other national legislatures. The chambers are spacious and handsome, so are the classified galleries for spectators, and the sessions are held in daylight. Equally impressive is the Supreme Court of the United States—a temple of equity in all its features, wherein the instinctive reverence for the highest embodiment of justice and legal authority is encouraged by the surroundings. The robes worn by

PENNSYLVANIA AVENUE, WASHINGTON

HOTEL
FITCH, FOX & BROWN

the justices invest the bench and court with a dignity which various state courts wisely emulate by adopting the same rule. Isolated in striking grandeur, the lofty Washington obelisk lifts the contemplative mind to heights above the level of material evidences of prosperity. Like the Stuart portrait, this memorial of Washington leaves the meaner measurements of a man's stature for other seasons and moods, and by a touch of sublimity gives the nobler cue to patriotic devotion and whole-hearted enthusiasm for him who, though human indeed, in his life-work neared the divine.

Summer is not the best time to appreciate the social life of the capital. It lies low, the Potomac's swampy margin is near and the street forests of trees aid humidity. The White House snugly reposes in beautiful grounds, with the great obelisk as a perpetual reminder of the first President's example and reward. Another white portico gleams in the distance, Arlington, the resting-place of the nation's hero-martyrs. In the winter season Washington blooms into cosmopolitan grandeur. It becomes the focus of the nation's lights in statesmanship, art, literature, and social pleasures. The foreign embassies supply the grace of brilliant color so lacking in the gatherings of men in the sombre attire of the period. A continuous round of social festivities gladdens the mild winter days and nights. Here, as in royal capitals, society has its greater and lesser constellations. There are the senatorial, judicial, diplomatic, military, and naval groups, too sharply divided, to judge from audible criticisms in New York circles. Still literature, art, and commerce have as free a welcome in Washington salons as anywhere else, despite the plaints of overlooked suppliants. The White House knows nothing of artificial shibboleths. It happily dispenses its hospitalities—which are coveted honors—impar-

tially upon all whom it is an honor to honor, and so sustains the true American principle of equal courtesy to citizens and sojourners of every degree. Washington is an inexhaustible field for the student of men, manners and movements, a theatre on whose stage the comedy of life plays itself, with all-potent moulders of opinion and legislation as the actors, backed by a supernumerary army of minor aids. Among its most eager auditors are outsiders, reporting every byplay to profoundly interested critics across the seas. The drama cannot be too deeply watched and pondered, for it is fraught with issues vital to the well-being of coming generations.

Chicago is usually figured as a conventionally insipid beauty, in flowing garments which would obstruct her progress and could never be kept white. This is a mistake. Most masculine of cities, most American of America's great centres, its shield should portray a strong youth in the flush of adolescence, conscious power in his proud curled lip, fire in his eye, springing to the foreground in the first ray of dawn, in his right hand the sceptre of genius and his left grasping the key of destiny. The good people of Chicago are not conspicuously lacking in civic self-appreciation. They are accustomed to being twitted by rivals in the rear on their boundless faith in their city's future greatness. They can afford to listen smilingly. If the child is father of the man, full-grown Chicago must some day tower above the up-stretched heads of its envious seniors like a giant among, say, a committee of venerable municipal Solons. Ordinary cities develop as babies do, slow growth to maturity, but this extraordinary late-comer into the family attained mental and muscular precocity in shorter time than its sisters required to cut their wisdom-teeth. Considered in relation to its geographical position

and its express-speed rate of progress, Chicago has the promise and potency of an imperial greatness no easier to exaggerate than to limit. It was tried by fire in the day of small things, but quickly rose to a new life and it still carries the memorial glow in its heart as an inspiration to great things.

The word Chicago is a simpler form of the Indian name, Chacaqua, given to the river in honor of their deity, the Thunderer. The position of Chicago makes it the greatest lake port in the world. It is already the second city in the United States, though only born in 1830, and has hopes of becoming the first, by growth, and not by annexation policy. True, the newest city inherits the wealth and experience which the older ones had to gain for themselves, yet Chicago has done some fine original things. It hitched up an inland sea as its beast of burden and made a vast lake its pleasure pond. Finding itself only seven feet above the level of Lake Michigan it lifted itself bodily another seven feet, churches, warehouses, dwellings and all, with jack-screws, and shovelled a new foundation of dry earth beneath. Fifteen years later the great fire laid it lower than ever. On Oct. 8, 1871, began the disaster that made nearly a hundred thousand people homeless, destroyed seventeen thousand buildings and two hundred lives, and caused the loss of two hundred millions of dollars. Within a year or so the wooden town was transformed into a city of massive palaces built of stone and brick. It is now fast changing itself into a maze of towering Babels, whose tops support the pall of smoke that tells of manufacturing activity. It drove tunnels beneath its river for street-cars. Its thirty-five bridges were not enough for the constant rush. On its lake first swam the novel whale-back boats. One sin will rise up against the city on the day of doom: the twenty-mile line

of lake shore has been largely prostituted to railway interests instead of being conserved as an unrivalled pleasure park for the people and an adornment to the city. It can plead in mitigation of sentence that its six public parks cover more than three square miles, besides some sixty linear miles of park-like boulevards of which Paris might be proud. Of these Michigan Avenue has a well-won fame. No business traffic is permitted on its wide and well-sprinkled roadway, the morning and afternoon procession of carriages taking its wealthy residents to and from business at times recalls the Queen's Drive in the London season. If the Chicago man of affairs works hard at his calling, he takes his pleasure zestfully and plenty of it. On the grand occasion of the American Derby (for Chicago has its Epsom and Ascot in one) it is a revelation to see the gay caravan *en route* to the race-course, as impressive a display of metropolitan luxury as any capital can present. And on this day the West can match the big crowds of England with this sixty thousand throng, each person paying two dollars for bare admission to the ground.

In a city primarily devoted to business it takes time for the development of the beautiful. Chicago has its "sights" for seekers after the merely outlandish, who often miss the real greatnesses that are less catchy to the eye. One of its achievements which impresses both the trained and untrained observer is the undertaking which has the uninviting name of Drainage Canal. The pure water of Lake Michigan used to be polluted by the inflow of the Chicago River. To prevent this the city has made an immense waterway by which the lake water is carried to the Illinois River and the tide of the Chicago River is diverted from its former course. The new canal is navigable and opens a route between the great lakes and the

Gulf of Mexico. The territory involved embraces the city and forty-three square miles of Cook County. The main channel is twenty-eight miles long and the cost was about thirty millions.

In their commercial aspect the famous Stock-yards have greater interest than as a show place. They cover four hundred acres, the plant is valued at four million dollars, and about twenty millions of animals are killed and packed in a year. Similarly imposing are the statistics of most of Chicago's enterprises. The Board of Trade is one of the most remarkable sights in the country. Its public galleries are usually filled with spectators of the feverish bidding of the grain operators, whose slightest nod affects the markets of the world. The Stock Exchange is yearly taking a more important share in the money market. The financial institutions of Chicago and the West have more than once saved the East from impending panic, and immense loans are constantly being renewed, insuring the speedy recognition of the city as a force in the money markets of the nations.

More interesting is the honor-roll of Chicago's intellectual enterprise. The Columbian World's Fair of 1893 astonished the world with its beauty, its perfection of artistic skill and taste. It gave an impetus to the pursuit of the beautiful and refining which has borne substantial results. Near the site of the Fair is a cluster of buildings constituting the University of Chicago, dating from 1891, to which a single donor has given nine million dollars, and loyal citizens are continually adding to its possessions. The heads of the University count on an endowment fund of fifty millions. Nowhere is Chicago enthusiasm for progress more finely manifested than here. The great public libraries of the city are envied by foreign visitors. The central Public Library is a splendid triumph of archi-

tecture, next in interior elegance to the Library of Congress. It is valued at three millions, exclusive of its books. The Newberry and Crerar libraries form special branches of the system. The city's churches and charities are doing nobly in ameliorating the condition of the toilers and the handicapped in life's race. The name and fame of Miss Jane Addams and the Hull House settlement are world-wide. How difficult the task is may be conceived from the fact that out of a million and seven hundred thousand people in the city, nine hundred thousand are Americans, German, and Irish; the remainder represent twenty-four nationalities, exclusive of negroes. A report issued by an investigating committee of Hull House states that "the density of population in the Polish quarter in Chicago is three times that of the most crowded portions of Tokio, Calcutta, and many other Asiatic cities."

As in New York there is a marked tendency among the richer people to set up country homes. New suburban towns and villages of great attractiveness are drawing an increasing number away from the smoky city. On the other hand the far-famed hospitality of its people to prophets of every school of thought, and the spirit of enterprise which welcomes every new idea, attracts eccentrics and adventurers whose trumpetings are loud enough to mislead superficial observers into the notion that Chicago is the crank's paradise. If a fault at all, this amiable toleration leans to virtue's side. Rightly to appreciate the depth and breadth of Chicago's influence we must follow its trade to the remotest corners of the earth. We must trace the influences of its seats of learning and refinement. We must count, if we can, the tremendous results of its world-renowned enterprises that have stimulated nations to follow the successful lead. Be its faults what they may, Chicago has the heart, the will, and the muscle

to mend them, as the world will see, and then will the true greatness of the Western metropolis be discerned, and its full influence be felt.

WINNIPEG LAKE AND RIVER.

W. F. BUTLER.

[Colonel W. F. Butler, in "The Great Lone Land," gives us some very interesting information about the life and scenery of the great American Northwest, from which we select the following description of a picturesque lake and river. His journey was made during the Riel rebellion, and the traveller was on his way to the Lake of the Woods, where he expected to meet an expedition sent for the suppression of the rebellion. The Red River Indians gave him a hearty send-off.]

THE chief gave a signal, and a hundred trading guns were held aloft, and a hundred shots rang out on the morning air. Again and again the salutes were repeated, the whole tribe moving down to the water's edge to see me off. Putting out to the middle of the river, I discharged my fourteen-shooter into the air in rapid succession; a prolonged war-whoop answered my salute, and, paddling their very best, for the eyes of the finest canoers were upon them, my men drove the little craft flying over the water until the Indian village and its still firing braves were hidden behind a river bend. Through many marsh-lined channels, and amidst a vast sea of reeds and rushes, the Red River of the North seeks the water of Lake Winnipeg. A mixture of land and water, of mud, and of the varied vegetation which grows thereon, this delta of the Red River is, like other spots of a similar description, inexplicably lonely.

The wind sighs over it, bending the tall weeds with mournful rustle, and the wild bird passes and repasses with plaintive cry over the rushes which form his summer home.

Emerging from the sedges of the Red River, we shot out into the waters of an immense lake,—a lake which stretched away into unseen spaces, and over whose waters the fervid July sun was playing strange freaks of mirage and inverted shore-land.

This was Lake Winnipeg,—a great lake, even on a continent where lakes are inland seas. But vast as it is now, it is only a tithe of what it must have been in the earlier ages of the earth.

The capes and headlands of what once was a vast inland sea now stand far away from the shores of Winnipeg. Hundreds of miles from its present limits these great landmarks still look down on the ocean, but it is an ocean of grass. The waters of Winnipeg have retired from their feet, and they are now mountain-ridges, rising over seas of verdure. At the bottom of this by-gone lake lay the whole valley of the Red River, the present Lakes Winnepegoos and Manitoba, and the prairie islands of the Lower Assiniboine,—one hundred thousand square miles of water. The water has long since been drained off by the lowering of the rocky channels leading to Hudson Bay, and the bed of the extinct lake now forms the richest prairie-land in the world.

But although Winnipeg has shrunken to a tenth of its original size, its rivers still remain worthy of the great basin into which they once flowed. The Saskatchewan is longer than the Danube, the Winnipeg has twice the volume of the Rhine. Four hundred thousand square miles of continent shed their waters into Lake Winnipeg; a lake as changeful as the ocean, but, fortunately for us, in

its very calmest mood to-day. Not a wave, not a ripple on its surface, not a breath of breeze to aid the untiring paddles. The little canoe, weighed down by men and provisions, had scarcely three inches of its gunwale over the water, and yet the steersman held his course far out into the glassy waste, leaving behind the marshy headlands which marked the river's mouth.

A long low point stretching from the south shore of the lake was faintly visible on the horizon. It was past midday when we reached it; so, putting in among the rocky boulders which lined the shore, we lighted our fire and cooked our dinner. Then, resuming our way, the Grand Traverse was entered upon. Far away over the lake arose the point of the Big Stone, a lonely cape whose perpendicular front was raised high above the water. The sun began to sink towards the west; but still not a breath rippled the surface of the lake, not a sail moved over the wide expanse, all was as lonely as though our tiny craft had been the sole speck of life on the waters of the world. The red sun sank into the lake, warning us that it was time to seek the shore and make our beds for the night. A deep sandy bay, with a high backing of woods and rocks, seemed to invite us to its solitudes. Steering in with great caution among the rocks, we landed in this sheltered spot, and drew our boat upon the sandy beach. The shore yielded large store of drift-wood, the relics of many a northern gale. Behind us lay a trackless forest, in front the golden glory of the western sky. As the night shades deepened around us and the red glare of our drift-wood fire cast its light upon the woods and rocks, the scene became one of rare beauty.

As I sat watching from a little distance this picture so full of all the charms of the wild life of the *voyageur* and the Indian, I little marvelled that the red child of the lakes

and the woods should be loath to quit such scenes for all the luxuries of our civilization. Almost as I thought with pity over his fate, seeing here the treasures of nature which were his, there suddenly emerged from the forest two dusky forms. They were Ojibbeways, who came to share our fire and our evening meal. The land was still their own. When I lay down to rest that night on the dry sandy shore, I long watched the stars above me. As children sleep after a day of toil and play, so slept the dusky men who lay around me. It was my first night with these poor wild sons of the lone spaces; it was strange and weird, and the lapping of the mimic wave against the rocks close by failed to bring sleep to my thinking eyes.

[The next day an early start was made.]

We entered the mouth of the Winnipeg River at mid-day and paddled up to Fort Alexander, which stands about a mile from the river's entrance. Here I made my final preparations for the ascent of the Winnipeg, getting a fresh canoe better adapted for forcing the rapids, and at five o'clock in the evening started on my journey up the river. Eight miles above the fort the roar of a great fall of water sounded through the twilight. In surge and spray and foaming torrent the enormous volume of the Winnipeg was making its last grand leap on its way to mingle its waters with the lake. On the flat surface of an enormous rock which stood well out into the boiling water we made our fire and our camp.

The pine-trees which gave the fall its name stood round us dark and solemn, waving their long arms to and fro in the gusty winds that swept the valley. It was a wild picture. The pine-trees standing in inky blackness; the rushing water, white with foam; above, the rifted thunder-clouds. Soon the lightning began to flash and the voice of

the thunder to sound above the roar of the cataract. My Indians made me a rough shelter with cross poles and a sail-cloth, and, huddling themselves together under the upturned canoe, we slept regardless of the storm. . . .

A man may journey very far through the lone spaces of the earth without meeting with another Winnipeg River. In it nature has contrived to place her two great units of earth and water in strange and wild combinations. To say that the Winnipeg River has an immense volume of water, that it descends three hundred and sixty feet in a distance of one hundred and sixty miles, that it is full of eddies and whirlpools, of every variation of waterfall from chutes to cataracts, that it expands into lonely pine-cliffed lakes and far-reaching island-studded bays, that its bed is cumbered with immense wave-polished rocks, that its vast solitudes are silent and its cascades ceaselessly active,—to say all this is but to tell in bare items of fact the narrative of its beauty. For the Winnipeg, by the multiplicity of its perils and the ever-changing beauty of its character, defies the description of civilized men as it defies the puny efforts of civilized travel. It seems part of the savage,—fitted alone for him and for his ways, useless to carry the burdens of man's labor, but useful to shelter the wild things of wood and water which dwell in its waves and along its shores. And the red man who steers his little birch-bark canoe through the foaming rapids of the Winnipeg, how well he knows its various ways! To him it seems to possess life and instinct, he speaks of it as one would of a high-mettled charger which will do anything if he be rightly handled. It gives him his test of superiority, his proof of courage. To shoot the Otter Falls or the Rapids of Barrière, to carry his canoe down the whirling of Portage-de-l'Isle, to lift her from the rush of water at the Seven Portages, or launch her by the edge of the whirlpool below the Chute-à-Jocko,

all this is to be a brave and a skilful Indian, for the man who can do all this must possess a power in the sweep of his paddle, a quickness of glance, and a quiet consciousness of skill, not to be found except after generations of practice. For hundreds of years the Indian has lived amidst these rapids, they have been the playthings of his boyhood, the realities of his life, the instinctive habit of his old age. What the horse is to the Arab, what the dog is to the Esquimaux, what the camel is to those who journey across Arabian deserts, so is the canoe to the Ojibbeway. Yonder wooded shore yields him from first to last the materials he requires for its construction: cedar for the slender ribs, birch bark to cover them, juniper to stitch together the separate pieces, red pine to give resin for the seams and crevices. By the lake or river shore, close to his wigwam, the boat is built;

> "And the forest life is in it,—
> All its mystery and its magic,
> All the tightness of the birch-tree,
> All the toughness of the cedar,
> All the larch's supple sinews.
> And it floated on the river
> Like a yellow leaf in autumn,
> Like a yellow water-lily."

It is not a boat, it is a house; it can be carried long distances overland from lake to lake. It is frail beyond words, yet you can load it down to the water's edge; it carries the Indian by day, it shelters him by night; in it he will steer boldly out into a vast lake where land is unseen, or paddle through mud and swamp or reedy shallows; sitting in it, he gathers his harvest of wild rice, or catches his fish or shoots his game; it will dash down a foaming rapid, brave a fiercely running torrent, or lie like a sea bird on the placid water.

For six months the canoe is the home of the Ojibbeway.

While the trees are green, while the waters dance and sparkle, while the wild rice bends its graceful head in the lake, and the wild duck dwells amidst the rush-covered mere, the Ojibbeway's home is the birch-bark canoe. When the winter comes and the lake and rivers harden beneath the icy breath of the north wind, the canoe is put carefully away; covered with branches and with snow, it lies through the long dreary winter until the wild swan and the wavey, passing northward to the polar seas, call it again from its long icy sleep.

Such is the life of the canoe, and such the river along which it rushes like an arrow.

The days that now commenced to pass were filled from dawn to dark with moments of keenest enjoyment, everything was new and strange, and each hour brought with it some fresh surprise of Indian skill or Indian scenery.

The sun would be just tipping the western shores with his first rays when the canoe would be lifted from its ledge of rock and laid gently on the water; then the blankets and kettles, the provisions and the guns, would be placed in it, and four Indians would take their seats, while one remained on the shore to steady the bark upon the water and keep its sides from contact with the rock; then when I had taken my place in the centre, the outside man would spring gently in, and we would glide away from the rocky resting-place. To tell the mere work of each day is no difficult matter: start at five o'clock A.M., halt for breakfast at seven o'clock, off again at eight, halt at one o'clock for dinner, away at two o'clock, paddle until sunset at seven-thirty; that was the work of each day. But how shall I attempt to fill in the details of scene and circumstance between these rough outlines of time and toil, for almost every hour of the long summer day the great Winnipeg revealed some new phase of beauty and of peril,

some changing scene of lonely grandeur? I have already stated that the river in its course from the Lake of the Woods to Lake Winnipeg, one hundred and sixty miles, makes a descent of three hundred and sixty feet.

This descent is effected not by a continuous decline, but by a series of terraces at various distances from each other; in other words, the river forms innumerable lakes and wide expanding reaches bound together by rapids and perpendicular falls of varying altitude; thus when the *voyageur* has lifted his canoe from the foot of the Silver Falls and launched it again above the head of that rapid, he will have surmounted two-and-twenty feet of the ascent; again, the dreaded Seven Portages will give him a total rise of sixty feet in a distance of three miles. (How cold does the bare narration of these facts appear beside their actual realization in a small canoe manned by Indians!) Let us see if we can picture one of these many scenes. There sounds ahead a roar of falling water, and we see, upon rounding some pine-clad island or ledge of rock, a tumbling mass of foam and spray studded with projecting rocks and flanked by dark wooded shores; above we can see nothing, but below, the waters, maddened by their wild rush amidst the rocks, surge and leap in angry whirlpools. It is as wild a scene of crag and wood and water as the eye can gaze upon, but we look upon it not for its beauty, because there is no time for that, but because it is an enemy that must be conquered.

Now mark how these Indians steal upon this enemy before he is aware of it. The immense volume of water, escaping from the eddies and whirlpools at the foot of the fall, rushes on in a majestic sweep into calmer water; this rush produces along the shores of the river a counter- or back-current which flows up sometimes close to the foot of the fall; along this back-water the canoe is carefully

steered, being often not six feet from the opposing rush in the central river; but the back-current in turn ends in a whirlpool, and the canoe, if it followed this back-current, would inevitably end in the same place. For a minute there is no paddling, the bow-paddle and the steersman alone keeping the boat in her proper direction as she drifts rapidly up the current. Among the crew not a word is spoken, but every man knows what he has to do, and will be ready when the moment comes; and now the moment has come, for on one side there foams along a mad surge of water, and on the other the angry whirlpool twists and turns in smooth hollowing curves round an axis of air, whirling round it with a strength that would snap our birch bark into fragments, and suck us down into the great depths below. All that can be gained by the back-current has been gained, and now it is time to quit it; but where? for there is often only the choice of the whirlpool or the central river. Just on the very edge of the eddy there is one loud shout given by the bow-paddle, and the canoe shoots full into the centre of the boiling flood, driven by the united strength of the entire crew; the men work for their very lives, and the boat breasts across the river, with her head turned full towards the falls; the waters foam and dash about her, the waves leap high over the gunwale, the Indians shout as they dip their paddles like lightning into the foam, and the stranger to such a scene holds his breath amidst this war of man against nature. Ha! the struggle is useless; they cannot force her against such a torrent; we are close to the rocks and foam; but see, she is driven down by the current, in spite of those wild fast strokes. The dead strength of such a rushing flood must prevail. Yes, it is true, the canoe has been driven back; but behold, almost in a second the whole thing is done,—we float suddenly beneath a little rocky isle on the foot of the

cataract. We have crossed the river in the face of the fall, and the portage landing is over this rock, while three yards out on either side the torrent foams its headlong course.

Of the skill necessary to perform such things it is useless to speak. A single false stroke and the whole thing would have failed; driven headlong down the torrent, another attempt would have to be made to gain this rock-protected spot, but now we lie secure here; spray all around us, for the rush of the river is on either side, and you can touch it with an outstretched paddle. The Indians rest on their paddles and laugh; their long hair has escaped from its fastening through their exertion, and they retie it while they rest. One is already standing upon the wet, slippery rock, holding the canoe in its place; then the others get out. The freight is carried up, piece by piece, and deposited on the flat surface some ten feet above; that done, the canoe is lifted out very gently, for a single blow against this hard granite boulder would shiver and splinter the frail birch-bark covering; they raise her very carefully up the steep face of the cliff and rest again on the top. What a view there is from coigne of vantage! We are on the lip of the fall; on each side it makes its plunge, and below we mark at leisure the torrent we have just braved; above, it is smooth water, and away ahead we see the foam of another rapid. The rock on which we stand has been worn smooth by the washing of the water during countless ages, and from a cleft or fissure there springs a pine-tree or a rustling aspen. We have crossed the Petit Roches, and our course is onward still.

Through many scenes like this we held our way during the last days of July. The weather was beautiful; now and then a thunder-storm would roll along during the night, but the morning sun, rising clear and bright, would almost tempt one to believe that it had been a dream, if

the pools of water in the hollows of the rocks and the dampness of blanket or oil-cloth had not proved the sun a humbug. Our general distance each day would be about thirty-two miles, with an average of six portages. At sunset we made our camp on some rocky isle or shelving shore: one or two cut wood, another got the cooking things ready, a fourth gummed the seams of the canoe, a fifth cut shavings from a dry stick for the fire; for myself, I generally took a plunge in the cool, delicious water; and soon the supper hissed in the pans, the kettle steamed from its suspending stick, and the evening meal was eaten with appetites such as only the *voyageur* can understand.

Then when the shadows of the night had fallen around and all was silent, save the river's tide against the rocks, we would stretch our blankets on the springy moss of the crag, and lie down to sleep with only the stars for a roof.

Happy, happy days were these,—days the memory of which goes very far into the future, growing brighter as we journey farther away from them; for the scenes through which our course was laid were such as speak in whispers, only when we have left them,—the whispers of the pine-tree, the music of running water, the stillness of great lonely lakes.

A FINE SCENIC ROUTE.

HENRY T. FINCK.

[From Henry T. Finck's "The Pacific Coast Scenic Tour" we select the following description of the Canadian Pacific Railway route, which is acknowledged to possess a long succession of grand and beautiful scenery, unequalled by any other railroad route in America. The description is too long a one to be given in full, and for further acquaintance with it the reader must be referred to the book itself.]

AFTER leaving Vancouver, and before reaching Westminster, the train for some time runs along Burrard Inlet, on which is situated Fort Moody, another town which had hoped to be chosen as terminus, and actually did enjoy that privilege for a short time. The shores of the inlet are beautifully wooded, and some of the trees are of enormous size. At the crossing of Stave River a fine view is obtained of Mount Baker, looking forward to the right; and the bridge over the Harrison River, where it meets the Frazer, also affords a picturesque view. For the next fifteen or sixteen hours the train follows the banks of the Frazer River and its tributaries, and this is one of the grandest sections of the route.

At the first the Frazer is a muddy, yellow river, about the size of the Willamette above Oregon City, but more rapid and winding, and an occasional steamer may be seen floating along with the current, or slowly making headway against it. In some places the railway runs so close to the precipitous bank of the river that a handkerchief might be dropped from a car window into the swirling eddies, fifty feet below. At other places it leaves room—and just room enough—for the old wagon-road between the track and the river; but it would take a cool driver, with much confidence in his horses, to remain on his wagon here when a train passes. At last the road itself becomes frightened and crosses the river on a bridge, whereupon it winds along the hill-side above the opposite bank, at a safe distance.

This road was made during the Frazer River gold excitement in 1858, when twenty-five thousand miners flocked into this region, and wages for any kind of work were ten to eighteen dollars a day. To-day the metal no longer exists in what white men consider paying quantity; but Chinamen may still be seen along the river, washing for remnants, their earnings being about fifty cents a day.

There is also a "Ruby Creek" in this neighborhood, and some Indian habitations and salmon-fishing places. Shortly before reaching Yale, which for a long time was the western end of the road, there is a slight intermission in the scenic drama, represented by some rich, level, agricultural lands, as if to give the passengers a moment's rest before the wonders of the Frazer Cañon begin to monopolize their bewildered attention, till darkness sets in and drops the curtain on the superb panorama.

Yale, which is so completely shut in by high, frowning mountain walls on every side that the sun touches the village only during part of the day, has lost its importance since it ceased to be a terminus, and seems at present to be inhabited chiefly by Indians and half-breeds. The train is invaded by a bevy of half-breed girls with baskets of splendid apples and pears, which could not be beaten for size and flavor in any of our States, and indicate a possible use for these mountain regions in the future. And now the train plunges into the midst of the series of terrific gorges which constitute the Frazer Cañon, and which make this railway literally the most gorge-ous in the world. Here were appalling engineering difficulties to overcome, which no private corporation without the most liberal government support could have undertaken. Yet the builders had to be thankful even for this wild and rugged cañon dug out by the Frazer River, without which the Cascade range would have been impassable.

The palace cars of the Canadian Pacific, which contain all the best features of the Pullman cars, with home improvements, have a special observatory, with large windows, at the end of the train, whence the cañon should be viewed; but to see it at its best one must sit on the rear platform, so as to see at the same time both of the wild and precipitous cañon walls, between which the river

rushes along as if pursued by demons. At every curve you think the gorge must come to an end, but it only grows more stupendous, and the river, lashed into foam and fury, dashes blindly against the rocks which try to arrest its course. These rocks, ten to thirty feet wide and sometimes twice as long, form many pretty little stone islands in the middle of the torrent, and are a characteristic feature of the cañon scenery. Numerous tunnels, resembling those on the Columbia River, are built through arches seemingly projecting over the river. The train plunges into them recklessly, but always comes out fresh and smiling on the other side, although it seems that if the bottom of the tunnel should by any chance drop out, the train would be precipitated into the river below.

Once in a while the river takes a short rest, and in these comparatively calm stretches hundreds of beautiful large red fish can be seen from the train, in the clear water, struggling up-stream. With their dark backs and bright red sides they form a sight which is none the less interesting when you are told that they are "only dog salmon," which are not relished by whites, though the Indians eat them.

[A night now passes, during which much fine scenery is missed. But the best is reserved for the next day.]

Scenic wonders now succeed one another with bewildering rapidity throughout the day. This second day, in fact, represents the climax of the trip, and the attention is not allowed to flag for a second. However much such a confession may go against the grain of patriotism, every candid traveller must admit that there is nothing in the United States in the way of massive mountain scenery (except, perhaps, in Alaska) to compare with the glorious panorama which is unfolded on this route. Within thirty-six hours after leaving Vancouver we traverse three of the

MEMORIAL MONUMENT TO SAMUEL DE CHAMPLAIN, FOUNDER OF QUEBEC

grandest mountain ranges in America,—the Cascades, Selkirks, and Rockies,—all of them the abode of eternal snow and glaciers, and all of them traversed through by cañons which vie with each other in terrific grandeur.

Before the Selkirks are reached the train passes the Columbia or Gold range, through the Eagle Pass, so called because it was discovered by watching an eagle's flight. Eagle's Pass is a poetic and appropriate name, and yet I think it would be well to rename this mountain pass and call it Mirror Lake Cañon, because that would call the attention of tourists to what is its most characteristic feature, which may otherwise be overlooked. There are four lakes and many smaller bodies of water in this valley, in whose placid surface the finely-sloped mountain ridges and summits of the pass are reflected with marvellous distinctness, so that here, as in the Yosemite Mirror Lake, the copy is more lovely than the original. Some of the mountain-sides reflected in these mirrors are naked rocks, others are covered with living evergreen trees, and others still with dead trees. In the mirror these dead forests look hardly less beautiful than the living ones; but in the original the eye dwells with more pleasure on the green forests which here, and almost everywhere in British Columbia, grow with the rank luxuriance of a Ceylon jungle. The soil under these dense tree-masses, consisting of decayed pine- and fir-needles, a foot deep, and always moist, makes a paradise for lovely mosses and ferns. Here, also, is the home of the bear, and one would not have to walk far in this thicket to encounter a grizzly, black, or cinnamon bruin.

On emerging from the Mirror Lake Cañon, a great surprise awaits the passengers. The Columbia River—to which they had fancied they had said a final farewell when they were ferried across it on the way from Portland to Tacoma—suddenly comes upon the scene again, as clear

and as picturesque as ever; and even at this immense distance from its mouth still large enough to require a bridge half a mile long to cross it. A few hours later the train again crosses the Columbia, at Donald, where the river has become much smaller than it seems that it should in such a short distance.

To get an explanation of this circumstance, it is interesting to glance at the map and notice what an immense curve northward the Columbia has made in this interval in order to find a passage through the Selkirk range; and in thus encircling the snowy Selkirks it has, of course, added to its volume the contents of innumerable glacier streams and mountain brooks. Its real sources are southeast of Donald, on the summit of the Rockies, separated by but a short distance from springs which run down on the eastern side and find their way through the Mississippi into the Gulf of Mexico. Thus do extremes meet. It would be difficult to find anything so curious in the course of any other river as this immense, irregular parallelogram which the Columbia here describes from its sources to Arrow Lake. . . .

The snow-peaks of the Selkirks are now looming up on all sides, and the atmosphere becomes more bracing and Alpine as the train slowly creeps up the mountain-side, doubling up on itself in a loop. The Glacier House is reached before long, and here every tourist who has time to spare should get off and spend a day or two, since next to Banff, in the National Park, this is the finest point along the whole route, scenically speaking, while the air is even more salubrious, cool, and intoxicating than at Banff, owing to the nearness of the glacier. It would be difficult, even in Switzerland, to find a more romantic spot for a hotel than the location of the Glacier House. High peaks rise up on every side, so finely moulded, so deeply mantled

with snow, and presenting such various aspects from different points of view, that we forget our disgust at the fact that, as usual in the West, these grand eternal peaks have been named after ephemeral mortals,—Browns, Smiths, and Joneses. The Grizzly and Cougar Mountains are more aptly named, as these animals will long continue to abound in the impenetrable forests which adorn these peaks below the snow-line. Looking from the hotel towards the glacier, to the left is a peak which looks like the Matterhorn, the most unique mountain in Switzerland, and, what is still more striking, at its side is another smaller peak, which is an exact copy of the Little Matterhorn. . . .

The principal difference between the Swiss Alps and the Selkirk range lies in the aspect of the mountain-sides below the snow-line. These, in Switzerland, are green meadows dotted with browsing cows, and presenting one unbroken mass of dark green, except where an avalanche has tobogganed down and opened what seems at a distance like a roadway, but is found to be a battle-field strewn with the corpses of cedars three and four feet in diameter.

The most imposing view of such a mountain forest unbroken by a single avalanche path is obtained from the snow-sheds just above the hotel. Sitting outside these sheds and looking towards the left, you see a vast mountain slope covered with literally millions of dark-green trees. Why has none of the world's greatest poets ever been permitted to gaze on such a Selkirk forest, that he might have aroused in his unfortunate readers who are not privileged to see one emotions similar to those inspired by it? But I fear that neither verse nor photographs, nor even the painter's brush, can ever more than suggest the real grandeur of such a forest scene. This mountain is not snow-crowned in September, but its wooded summit makes a sharp green line against the snow-peaks beyond

and above. From this summit down to the foot stand the giant cedars, as crowded as the yellow stalks in a Minnesota wheatfield. But in place of the flat monochrome of a wheatfield, our sloping forest presents a most fascinating color spectacle. The slanting rays of the sun tinge the waving tree-tops with a deeply saturated yellowish-green, curiously interspersed with a mosaic of dark, almost black streaks and patches of shade, due to clouds and other causes, and the whole edged by the dazzling snow.

If we descend and enter this forest, a cathedral-like awe thrills the nerves. Daylight has not the power to penetrate to the ground hidden by this dense mass of tree-tops rising two hundred to three hundred feet into the air,—except that an occasional ray of sunlight may steal in for a second, like a flash of lightning. And the carpet on which this forest stands! In America we rarely see a house, even of a day-laborer, without a carpet; why, then, should these royal trees do without one? The carpet is itself a miniature forest of ferns and mosses, luxuriating in riotous profusion on an ever-moist soil, the product of thousands of generations of pine-needles. Nor is this carpet a monochrome, for the green is varied by numerous berries of various kinds, most of which are red, as they should be,—the complementary color of green. But there are also acres of blueberries as large as cherries; and if you will tear off a few branches of these and bring them to the young bear chained up near the Glacier Hotel, he will be very grateful, and you will find it amusing to watch him eating them.

There is music, too, in this Forest Cathedral, which is heard to best advantage from the elevated gallery occupied by the snow-sheds. It takes a trained ear to distinguish the steady, rippling *staccato* sound of a snow-fed mountain brook from the prolonged *legato* sigh of a pine

forest, swelling to *fortissimo*, and dying away by turns. In the romantic spot we have chosen these sounds are blended, the music of the torrents being caught up by the sloping forest as by a huge sounding-board, and increased in loudness by being mingled with the mournful strains of the tree-tops, as orchestral colors are blended by modern masters. Those err who say there is no music in nature. It is not in "Siegfried" alone that the *Waldweben* is musical, that leaves sing as well as birds, while the thunder occasionally adds its loud *basso profundo*. The æsthetic exhilaration which we owe to these poetic sights and sounds is intensified by the salubrious breezes which waft this music to our ears. Born among the clouds and glaciers, they are perfumed in passing across the forests, warmed by the sun's rays in passing over the valley; and every breath of this elixir adds a day to one's life. It is not surprising that mountains should make the best health-resorts; for do they not themselves understand and obey the laws of health? They keep their heads cool under a snow-cap, their feet warm in a mossy blanket, and their sides covered with a dense *fir* overcoat. . . .

For the greater part of the two hours which the train requires to go from Donald to Golden City it passes along the bank of the Columbia River; and there is, perhaps, no part of the whole route where grandeur and beauty are so admirably united as here, especially in the autumn. The grandeur lies in the snowy summits which frame in this Columbia valley—the Selkirks on one side, the Rockies on the other. The beauty lies in the river itself and in the young trees and bushes along its banks, dressed in fall styles and colors, some as richly yellow as a golden-rod, others as deeply purple or crimson as fuchsias or begonias, the yellow predominating. These colored trees occur in groups and streaks along the river, and in isolated patches

on the mountain-sides, where they might be mistaken for brown mosses or lichen-colored rocks. There may be as beautifully colored trees in our Eastern forests, but they are not mixed, as here, with young evergreen pines, nor have they a framework of snow mountains, like these, to enhance their beauty.

High up on the ridges there is another variety of trees of a beautiful russet color set off by a deep-blue sky. Talk of color symphonies. Here they are—miles of them—long as a Wagner trilogy, and as richly orchestrated. Even the masses of blackened logs and stumps—if one can set aside for the moment all thought of pity for the poor charred trees, so happy before the fire in their green luxuriance, and of the sad waste of useful timber—enhance the charm of this scene by contrast.

I have said that the time-table of the Canadian Pacific Railway is so arranged that the finest scenery is passed in daylight, in both directions; but of course there must be exceptions, and, as a matter of fact, as long as the road crosses the three great mountain ranges of the Cascades, Selkirks, and Rockies, there is hardly a mile that does not offer something worth seeing. Consequently, as darkness again closes in soon after leaving Golden, east-bound passengers must resign themselves to lose sight of the Kicking Horse Cañon, the Beaverfoot and Ottertail Mountains, the large glacier on Mount Stephen, etc.,—which is all the more provoking as they have to sit up anyway till midnight, when Banff is reached; for, of course, every tourist who is in his right senses and not a slave to duty gets off here to spend a few days in the Canadian National Park.

[The description of this park we can give only in summary.]

Summing up on the Canadian National Park, we may say it has not so many natural wonders as the Yellowstone

Park,—no geysers, steam-holes, gold-bottomed rivulets, paint-pots, nor anything to place beside the Yellowstone Cañon and Falls. But the Minnewonka Lake may fairly challenge comparison with the Yellowstone Lake, and the mountain scenery is grander in the Canadian Park, and the snow and glaciers are nearer, though not so near as at the Glacier House, where the air is in consequence cooler and more bracing in summer than even at Banff. As the Canadian Park is only twenty-six miles long and ten wide, while the Yellowstone Park is about sixty-two by fifty-four miles, the former can be seen in much less time than it takes to do justice to the latter.

When we get ready to leave Banff we have to take the midnight train, so there is no chance to say good-by to the mountains. But we have seen so much of them since leaving Vancouver, that we have felt almost tempted to cry out to Nature, "Hold, enough; less would be more!" Now we get ample opportunity to ruminate in peace over our crowded impressions. When we get up we are on the prairie; we go to bed in the prairie, after traversing a territory larger than a European kingdom; again we rise on the prairie, and again go to bed on it; and not till Lake Superior is approached does the scenery once more become interesting. . . .

As a general thing, it is no doubt wiser to take the Canadian Pacific Railway westward than eastward, as the scenic climax is on the western side. However, it is quite possible to avoid the feeling of anti-climax on going east, if we conclude the trip with the Thousand Islands and the Rapids of the St. Lawrence, together with Montreal; or with Niagara Falls and the Hudson River. The Pacific slope, no doubt, is scenically far more attractive than the Atlantic; still, there are some things in the East which even California would be proud to add to her attractions.

SOUTH PASS AND FREMONT'S PEAK.

JOHN C. FREMONT.

[Captain John Charles Fremont, one of the earliest government explorers of the Rocky Mountain region and the Pacific slope, was born at Savannah, Georgia, in 1813. Becoming a civil engineer in the government service, in 1842 he explored the South Pass of the Rocky Mountains, ascending in August the highest peak in the Wind River range. This has since been known as Fremont's Peak. In the following year he explored Great Salt Lake. In 1845 he led a third expedition to the Pacific, and during the Mexican war was instrumental in securing California for the United States. He led subsequent expeditions westward, was Republican candidate for the Presidency in 1856, served during the war, and in 1878–82 was governor of Arizona. He died in 1890. We subjoin his account of the crossing of the South Pass and discovery and ascent of Fremont's Peak.]

THE view [of the Wind River Mountains] dissipated in a moment the pictures which had been created in our minds by many travellers who have compared these mountains with the Alps in Switzerland, and speak of the glittering peaks which rise in icy majesty amidst the eternal glaciers nine or ten thousand feet into the region of eternal snows.

[Continuing their course, they encamped on August 7 near the South Pass, and the next morning set out for the dividing ridge.]

About six miles from our encampment brought us to the summit. The ascent had been so gradual that, with all the intimate knowledge possessed by Carson, who had made the country his home for seventeen years, we were obliged to watch very closely to find the place at which we reached the culminating point. This was between two low

hills, rising on either hand fifty or sixty feet. When I looked back at them, from the foot of the immediate slope on the western plain, their summits appeared to be about one hundred and twenty feet above. From the impression on my mind at this time, and subsequently on our return, I should compare the elevation which we mounted immediately at the Pass to the ascent of the Capitol hill from the avenue at Washington. It is difficult for me to fix positively the breadth of this pass. From the broken ground where it commences, at the foot of the White River chain, the view to the southeast is over a champaign country, broken, at the distance of nineteen miles, by the Table Rock, which, with the other isolated hills in its vicinity, seem to stand in a comparative plain. This I judged to be its termination, the ridge recovering its rugged character with the Table Rock.

It will be seen that it in no manner resembles the places to which the term is commonly applied,—nothing of the gorge-like character and winding ascents of the Alleghany passes in America; nothing of the Great St. Bernard and Simplon passes in Europe. Approaching it from the mouth of the Sweet Water, a sandy plain, one hundred and twenty miles long, conducts, by a gradual and regular ascent, to the summit, about seven thousand feet above the sea; and the traveller, without being reminded of any change by toilsome ascents, suddenly finds himself on the waters which flow to the Pacific Ocean. By the route we had travelled, the distance from Fort Laramie is three hundred and twenty miles, or nine hundred and fifty from the mouth of the Kansas.

[They continued their course westward, crossing several tributaries of the Colorado River, and on the 10th reached unexpectedly a beautiful lake.]

Here a view of the intensest magnificence and grandeur burst upon our eyes. With nothing between us and their feet to lessen the effect of the whole height, a grand bed of snow-capped mountains rose before us, pile upon pile, glowing in the bright light of an August day. Immediately below them lay the lake, between two ridges, covered with dark pines, which swept down from the main chain to the spot where we stood. "Never before," said Mr. Preuss, "in this country or in Europe, have I seen such grand, magnificent rocks." I was so much pleased with the beauty of the place that I determined to make the main camp here, where our animals would find good pasturage, and explore the mountains with a small party of men.

[On the 12th this party set out, crossing intervening hills, and ascending through dense forests to the summit of the ridge.]

We had reached a very elevated point, and in the valley below, and among the hills, were a number of lakes of different levels, some two or three hundred feet above others, with which they communicated by foaming torrents. Even to our great height the roar of the cataracts came up, and we could see them leaping down in lines of snowy foam. From this scene of busy waters we turned abruptly into the stillness of a forest, where we rode among the open bolls of the pines, over a lawn of verdant grass, having strikingly the air of cultivated grounds. This led us, after a time, among masses of rock, which had no vegetable earth but in hollows and crevices, though still the pine-forest continued. Towards evening we reached a defile, or rather a hole in the mountains, entirely shut in by dark pine-covered rocks.

[In the morning they ascended a mountain stream, to its source in a small lake surrounded by a lawn-like expanse.]

Here I determined to leave our animals, and make the rest of our way on foot. The peak appeared so near that

there was no doubt of our returning before night; and a few men were left in charge of the mules, with our provisions and blankets. We took with us nothing but our arms and instruments, and, as the day had become warm, the greater part left our coats. Having made an early dinner, we started again. We were soon involved in the most rugged precipices, nearing the central chain very slowly, and rising but little. The first ridge hid a succession of others; and when, with great fatigue and difficulty, we had climbed up five hundred feet, it was but to make an equal descent on the other side; all these intervening places were filled with small deep lakes, which met the eye in every direction, descending from one level to another, sometimes under bridges formed by huge fragments of granite, beneath which was heard the roar of the water. These constantly obstructed our path, forcing us to make long *détours;* frequently obliged to retrace our steps, and frequently falling among the rocks. Maxwell was precipitated towards the face of a precipice, and saved himself from going over by throwing himself flat on the ground. We clambered on, always expecting, with every ridge that we crossed, to reach the foot of the peaks, and always disappointed, until about four o'clock, when, pretty well worn out, we reached the shore of a little lake, in which was a rocky island.

By the time we had reached the farther side of the lake we found ourselves all exceedingly fatigued, and, much to the satisfaction of the whole party, we encamped. The spot we had chosen was a broad, flat rock, in some measure protected from the winds by the surrounding crags, and the trunks of fallen pines afforded us bright fires. Near by was a foaming torrent, which tumbled into the little lake about one hundred and fifty feet below us, and which, by way of distinction, we have called Island Lake.

We had reached the upper limit of the piney region; as, above this point, no tree was to be seen, and patches of snow lay everywhere around us, on the cold sides of the rock. From barometrical observations made during our three days' sojourn at this place, its elevation above the Gulf of Mexico is ten thousand feet. . . .

[They set out early the next morning.] On every side, as we advanced, was heard the roar of waters, and of a torrent, which we followed up a short distance, until it expanded into a lake about one mile in length. On the northern side of the lake was a bank of ice, or rather of snow covered with a crust of ice. Carson had been our guide into the mountains, and, agreeably to his advice, we left this little valley and took to the ridges again, which we found extremely broken, and where we were again involved among precipices. Here were ice-fields, among which we were all dispersed, seeking each the best way to ascend the peak. Mr. Preuss attempted to walk along the upper edge of one of these fields, which sloped away at an angle of about twenty degrees; but his feet slipped from under him, and he went plunging down the plain. A few hundred feet below, at the bottom, were some fragments of sharp rock, on which he landed; and, though he turned a couple of somersets, fortunately received no injury beyond a few bruises.

[That day's work failed, and they returned at evening to the camp. The next day they ascended a long defile on mule-back, and soon had the satisfaction to find that they had taken the right course. Finally, leaving their mules, they continued on foot, eventually reaching a point near the summit. Here was an overhanging buttress of rock, which could be surmounted only by passing around one side of it, which was the face of a precipice several hundred feet in depth.]

Putting hands and feet in the crevices between the blocks, I succeeded in getting over it, and when I reached

the top, found my companions in a small valley below. Descending to them, we continued climbing, and in a short time reached the crest. I sprang upon the summit, and another step would have precipitated me into an immense snow-field five hundred feet below. To the edge of this field was a sheer icy precipice; and then, with a gradual fall, the field sloped off for about a mile, until it struck the foot of another lower ridge. I stood on a narrow crest, about three feet in width, with an inclination of about 20° north, 51° east.

As soon as I had gratified the first feeling of curiosity I descended, and each man ascended in his turn; for I would only allow one at a time to mount the unstable and precarious slab, which it seemed a breath would precipitate into the abyss below. We mounted the barometer in the snow of the summit, and, fixing a ramrod in a crevice, unfurled the national flag to wave in the breeze where never flag waved before. During our morning's ascent we had met no sign of animal life, except a small sparrow-like bird. A stillness the most profound and a terrible solitude forced themselves constantly on the mind as the great features of the place. Here, on the summit, where the stillness was absolute, unbroken by any sound, and solitude complete, we thought ourselves beyond the region of animated life; but while we were sitting on the rock, a solitary bee (*Bombus, the humble-bee*) came winging his flight from the eastern valley, and lit on the knee of one of the men.

It was a strange place, the icy rock and the highest peak of the Rocky Mountains, for a lover of warm sunshine and flowers; and we pleased ourselves with the idea that he was the first of his species to cross the mountain barrier,—a solitary pioneer to foretell the advance of civilization. I believe that a moment's thought would have made us let

him continue his way unharmed; but we carried out the law of this country, where all animated nature seems at war; and seizing him immediately, put him in at least a fit place,—in the leaves of a large book, among the flowers we had collected on our way. The barometer stood at 18.293, the attached thermometer 44°; giving for the elevation of this summit thirteen thousand five hundred and seventy feet above the Gulf of Mexico, which may be called the highest flight of the bee. It is certainly the highest known flight of that insect.

From the description given by Mackenzie of the mountains where he crossed them, with that of the French officer still farther to the north, and Colonel Long's measurements to the south, joined to the opinion of the oldest traders of the country, it is presumed that this is the highest peak in the Rocky Mountains. [Fremont's Peak is now estimated at thirteen thousand seven hundred and ninety feet. There are many peaks now known over fourteen thousand feet. The highest point is Blanca Peak, fourteen thousand four hundred and sixty-three feet high.]

The day was sunny and bright, but a slight shining mist hung over the lower plains, which interfered with our view of the surrounding country. On one side we overlooked innumerable lakes and streams, the spring of the Colorado of the Gulf of California; and on the other was the Wind River Valley, where were the heads of the Yellowstone branch of the Missouri; far to the north we could just discover the snowy heads of the *Trois Tetons*, where were the sources of the Missouri and Columbia Rivers; and at the southern extremity of the ridge the peaks were plainly visible among which were some of the springs of the Nebraska or Platte River. Around us the whole scene had one main, striking feature, which was that of terrible convulsion. Parallel to its length, the ridge was split

into chasms and fissures; between which rose the thin lofty walls, terminated with slender minarets and columns.

[The party reached camp the next day, and on the 17th turned their faces homeward, the purpose of the expedition having been accomplished.]

IN THE YELLOWSTONE PARK.

FERDINAND V. HAYDEN.

[About the middle of this century reports began to be heard of a veritable wonderland in the far West, as yet seen only by trappers and other adventurers, whose stories of the marvels they had beheld whetted the appetite of scientific explorers. The first attempt to reach the region of the Yellowstone was made in 1856, but failed, and it was not until 1869 that an exploring party entered this marvellous valley. A second party reached the Yellowstone region in 1870, and Mr. N. P. Langford wrote a glowing account of the wonders observed. The first detailed description of the locality was made by Dr. Hayden, chief of the Geological Survey of the Territories, in 1871. From this extended and highly interesting account we can only quote a few passages, selecting those which relate to the hot springs and geysers of the wonderful Fire-Hole River region.]

EARLY in the morning of August 30 the valley was literally filled with columns of steam, ascending from more than a thousand vents. I can compare the view to nothing but that of some manufacturing city like Pittsburg, as seen from a high point, except that instead of the black coal smoke there are here the white delicate clouds of steam. Small groups or solitary springs that are scattered everywhere in the woods upon the mountain-sides, and which would otherwise have escaped observation, are detected by the columns of steam. It is evident that some of these groups

of springs have changed their base of operations within a comparatively recent period; for about midway on the east side of the lower basin there is a large area covered with a thick, apparently modern, deposit of the silica, as white as snow, while standing quite thickly all around are the dead pines, which appear to have been destroyed by the excessive overflow of the water and the increased deposition. These dry trees have a most desolate look; many of them have fallen down and are incrusted with the silica, while portions that have fallen into the boiling springs have been reduced to a pulp.

This seems to be one of the conditions of silicification, for when these pulpy masses of wood are permitted to dry by the cessation of the springs, the most perfect specimens of petrified wood are the result. In one instance a green pine-tree had fallen so as to immerse its thick top in a large hot basin, and leaves, twigs, and cones had become completely incrusted with the white silica, and a portion had entered into the cellular structure, so that when removed from the water and dried in the sun, very fair specimens were obtained. Members of my party obtained specimens of pine-cones that were sufficiently silicified to be packed away among the collections.

In order that we might get a complete view of the Lower Geyser Basin from some high point, we made a trip to the summit of Twin Buttes, on the west side of the basin. From the top of one of these buttes, which is six hundred and thirty feet above the Fire-Hole River, we obtained a bird's-eye view of the entire lower portion of the valley, which was estimated to be about twenty miles long and five miles wide. To the westward, among the mountains, were a number of little lakes, which were covered with a huge species of water-lily, *Nuphar advena*. The little streams precipitated their waters in the most picturesque

THE UPPER YELLOWSTONE FALLS

FROM A PAINTING BY THOMAS MORAN

cascades or falls. One of them was named by Colonel Barlow the "Fairy Fall," from the graceful beauty with which the little stream dropped down a clear descent of two hundred and fifty feet. It is only from a high point that it can be seen, for the water falls gently down from the lofty overhanging cliff into a basin at the foot, which is surrounded by a line of tall pines one hundred to one hundred and fifty feet in height. The continual flow of the waters of this little fountain has worn a deep channel or furrow into the vertical sides of the mountain. As far as the eye can reach can be seen the peculiar plateau mountain ranges, black with the dense forests of pine, averaging from nine thousand to ten thousand feet above sea-level. . . .

A spring on a level with the river has an enormous square basin thirty feet across, of unknown depth. We called this the "Bath Spring." A little below is another singular form of wonderful beauty. The water issues from beneath the crust near the margin of the river from several apertures. The basin itself is fifteen by twenty feet and twenty feet deep. It seemed to me that nothing could exceed the transparent clearness of the water. The slightest object was reflected in its clear depths, and the bright blue tints were indescribable. We called this the "Cavern." The mud springs are also numerous and important in this group. As usual, they are of all sizes, from an inch or two to twenty or thirty feet in diameter, with contents varying from mere turbid water to stiff mud. They seldom have any visible outlet, but are in a constant state of agitation, with a sound that varies with the consistency of the contents. There are several of the mud-pots that give off a suppressed thud as the gases burst their way through the stiff mortar. Sometimes the mortar is as white as snow, or brown, or tinged with a variety of vivid colors. . . .

On the west side of the Fire-Hole, and along the little

branch that flows into it from the west, are numbers of springs of all grades, and the broad bottom is covered with a snow-white silicious crust. Near the base of the mountains there is a massive first-class boiling spring, in a constant state of violent agitation, sending forth great columns of steam, with a singular toadstool rim. . . . About three miles up the Fire-Hole we meet with a small but quite interesting group of springs on both sides of the stream. There is a vast accumulation of silica, forming a hill fifty feet along the level of the river; upon the summit one of the largest springs yet seen, nearly circular, one hundred and fifty feet in diameter, boils up in the centre, but overflows with such uniformity on all sides as to admit of the formation of no real rim, but forming a succession of little ornamental steps, from one to three inches in height, just as water would congeal from cold in flowing down a gentle declivity. There was the same transparent clearness, the same brilliancy of coloring to the waters, but the hot steam and the thinness of the rim prevented me from approaching it near enough to ascertain its temperature or observe its depth. It is certainly one of the grandest hot springs ever seen by human eye.

But the most formidable one of all is near the margin of the river. It seems to have broken out close by the river, and to have continually enlarged its orifice by the breaking down of its sides. It evidently commenced on the east side, and the continual wear of the under side of the crust on the west side has caused the margin to fall in, until an aperture at least two hundred and fifty feet in diameter has been formed, with walls or sides twenty to thirty feet high, showing the laminæ of deposition perfectly. The water is intensely agitated all the time, boiling like a caldron, from which a vast column of steam is ever rising, filling the orifice. As the passing breeze sweeps it away for a mo-

ment, one looks down into this terrible seething pit with terror. All around the sides are large masses of the silicious crust that have fallen from the rim. An immense column of water flows out of this caldron into the river. As it pours over the marginal slope it descends by numerous small channels, with a large number of smaller ones spreading over a broad surface, and the marvellous beauty of the strikingly vivid coloring far surpasses anything of the kind we have seen in this land of wondrous beauty,—every possible shade of color, from vivid scarlet to a bright rose, and every shade of yellow to a delicate cream, mingled with vivid green from minute vegetation. Some of the channels were lined with a very fine, delicate yellow, silky material, which vibrates at every movement of the waters. There was one most beautiful funnel-shaped spring, twenty feet in diameter at the top, but tapering down, lined inside and outside with the most delicate decorations. Indeed, to one looking down into its clear depths, it seemed like a fairy palace. The same jelly-like substance or pulp to which I have before alluded covers a large area with the various shades of light red and green. The surface yields to the tread like a cushion. It is about two inches in thickness, and although seldom so tenacious as to hold together, yet it may be taken up in quite large masses, and when it becomes dry it is blown about by the wind, like fragments of variegated lichens.

[From this description of the hot springs of the region we proceed to an account of its marvellous geyser phenomena.]

We camped the evening of August 5 in the middle of the Upper Geyser Basin, in the midst of some of the grandest geysers in the world. Colonel Barlow and Captain Heap, of the United States Engineers, were camped on the opposite side of the Fire-Hole. Soon after reaching

camp a tremendous rumbling was heard, shaking the ground in every direction, and soon a column of steam burst forth from a crater near the edge of the east side of the river. Following the steam, arose, by a succession of impulses, a volume of water, apparently six feet in diameter, to the height of two hundred feet, while the steam ascended a thousand feet or more. It would be difficult to describe the excitement which attended such a display. It is probable that if we could have remained in the valley several days, and become accustomed to all the preliminary warnings, the excitement would have ceased, and we could have admired calmly the marvellous ease and beauty with which this column of hot water was held up to that great height for the space of twenty minutes. After the display is over the water settles down in the basin several inches, and the temperature slowly falls to 150°. We called this the "Grand Geyser," for its power seemed greater than any other of which we obtained any knowledge in the valley.

[After describing more particularly the peculiarities of the Grand Geyser and the smaller neighboring geysers, Dr. Hayden gives us an enthusiastic pen-picture of a beautiful type of springs.]

On the summit of the great mound is one of a class I have called central springs; it is located on the highest point of the mound on which this great group belongs; has a crater twenty feet in diameter, very nearly quiescent, slightly bubbling, or boils near the centre, with a thin, elegant rim projecting over the spring, with the water rising within a few inches of the top. The continual but very moderate overflow of this spring, uniformly on every side, builds up slowly a broad-based mound, layer by layer, one-eighth to one-sixteenth of an inch thick. Looking down into these springs, you seem to be gazing into fathomless depths, while the bright blue of the water is unequalled

even by the sea. There are a number of these marvellous central springs, with projecting rims carved with an intricate delicacy which of itself is a marvel; and as one ascends the mound and looks down into the wonderfully clear depths, the vision is unique. The great beauty of the prismatic colors depends much on the sunlight, but about the middle of the day, when the bright rays descend nearly vertically, and a slight breeze just makes a ripple on the surface, the colors exceed comparison; when the surface is calm there is one vast chaos of colors, dancing, as it were, like the colors of a kaleidoscope.

As seen through this marvellous play of colors, the decorations on the sides of the basin are lighted up with a wild, weird beauty which wafts one at once into the land of enchantment; all the brilliant feats of fairies and genii in the "Arabian Nights" entertainments are forgotten in the actual presence of such marvellous beauty; life becomes a privilege and a blessing after one has seen and thoroughly felt these incomparable types of nature's cunning skill. . . .

Our search for new wonders leading us across the Fire-Hole River, we ascended a gently incrusted slope, and came suddenly upon a large oval aperture with scalloped edges, the diameters of which were eighteen and twenty-five feet, the sides corrugated and covered with a grayish-white silicious deposit, which was distinctly visible at the depth of a hundred feet below the surface. No water could be discovered, but we could distinctly hear it gurgling and boiling at a great distance below. Suddenly it began to rise, boiling and spluttering, and sending out huge masses of steam, causing a general stampede of our company, driving us to some distance from our point of observation. When within about forty feet of the surface it became stationary, and we returned to look down upon it. It was foaming and surging at a terrible rate, occasionally

emitting small jets of hot water nearly to the mouth of the orifice.

All at once it seemed seized with a fearful spasm, and rose with incredible rapidity, hardly affording us time to withdraw to a safe distance, when it burst from the orifice with terrific momentum, rising in a column the full size of this immense aperture to the height of sixty feet; and through and out of the apex of this vast aqueous mass five or six lesser jets or round columns of water, varying in size from six to fifteen inches in diameter, were projected to the marvellous height of two hundred and fifty feet. These lesser jets, so much higher than the main column, and shooting through it, doubtless proceed from auxiliary pipes leading into the principal orifice near the bottom, where the explosive force is greater. If the theory that water by constant boiling becomes explosive when freed from air be true, this theory rationally accounts for all irregularities in the eruptions of the geysers.

This grand eruption continued for twenty minutes, and was the most magnificent sight we ever witnessed. We were standing on the side of the geyser nearest the sun, the gleams of which filled the sparkling column of water and spray with myriads of rainbows, whose arches were constantly changing, dipping and fluttering hither and thither, and disappearing only to be succeeded by others, again and again, amid the aqueous columns, while the minute globules into which the spent jets were diffused when falling sparkled like a shower of diamonds, and around every shadow which the denser clouds of vapor, interrupting the sun's rays, cast upon the column, could be seen a luminous circle, radiant with all the colors of the prism, and resembling the halo of glory represented in paintings as encircling the head of Divinity. All that we had previously witnessed seemed tame in comparison with the per-

fect grandeur and beauty of this display. Two of these wonderful eruptions occurred during the twenty-two hours we remained in the valley. This geyser we named the "Giantess."

A hundred yards distant from the Giantess was a silicious cone, very symmetrical, but slightly corrugated upon its exterior surface, three feet in height and five feet in diameter at its base, and having an oval orifice twenty-four by thirty-six and a half inches in diameter, with scalloped edges. Not one of our company supposed that it was a geyser; and among so many wonders it had almost escaped notice. While we were at breakfast upon the morning of our departure, a column of water, entirely filling the crater, shot from it, which, by accurate triangular measurement, we found to be two hundred and nineteen feet in height. The stream did not deflect more than four or five degrees from a vertical line, and the eruption lasted eighteen minutes. We named it the "Beehive." . . .

On our return to the lake from this basin we passed up the Fire-Hole River to its source in the divide. Early in the morning, as we were leaving the valley, the grand old geyser which stands sentinel at the head of the valley gave us a magnificent parting display, and with little or no preliminary warning it shot up a column of water about six feet in diameter to the height of a hundred to a hundred and fifty feet, and by a succession of impulses seemed to hold it up steadily for the space of fifteen minutes, the great mass of water falling directly back into the basin, and flowing over the edges and down the sides in large streams. When the action ceases, the water recedes beyond sight, and nothing is heard but the occasional escape of steam until another exhibition occurs. This is one of the most accommodating geysers in the basin, and during our stay played once an hour quite regularly. On account of

its apparent regularity, and its position overlooking the valley, it was called by Messrs. Langford and Doane "Old Faithful." It has built up a crater about twenty feet high around its base, and all about it are decorations similar to those previously described.

On the morning of August 6 we ascended the mountains at the head of the Fire-Hole River, on our return to the hot-spring camp on the Yellowstone Lake. We had merely caught a glimpse of the wonderful physical phenomena of this remarkable valley. We had just barely gleaned a few of the surface observations, which only sharpened our desire for a larger knowledge. There is no doubt in my mind that these geysers are more active at certain seasons of the year than at others. We saw them in midsummer, when the surface waters are greatly diminished. In the spring, at the time of the melting of the snows, the display of the first-class geysers must be more frequent and powerful. We left this valley, with its beautiful scenery, its hot springs and geysers, with great regret.

THE COUNTRY OF THE CLIFF-DWELLERS.

ALFRED TERRY BACON.

[Ruskin, among his reasons for not visiting the United States, declared that it would be impossible for him to exist, even for a short interval, in a country that had no old castles. Had he known it, he might have found here old castles in abundance, older perhaps, and grander in situation, than any to be found in his own land. These are the ruined dwellings of the ancient inhabitants of the western cañons and of the pueblo-builders of Arizona and New Mexico. We give a traveller's account of the Cliff-dwellers' habitations.]

The attraction which drew the conquerors of Mexico forty-five days' journey away into the North was the fame

which had reached them of the Seven Cities of Cibola (the buffalo), great in wealth and population, lying in the valley of the Rio de Zuñi. To the grief of the invaders, they found not cities, but rather villages of peaceful agricultural people dwelling in great pueblos three and four stories high, and they searched in vain for the rumored stores of gold. At that time the pueblos held a large population skilled in many arts of civilization. They cultivated large tracts of ground, wove fabrics of cotton, and produced ornate pottery. Their stone-masonry was admirable. But even three hundred years ago it seems that the people were but a remnant of what they had once been. Even then the conquerors wondered at the many ruins which indicated a decline from former greatness. The people have not now the same degree of skill in their native arts which the race once had, and it is probable that when the Spaniards came and found them declining in numbers the old handicrafts were already on the wane.

In a remote age the ancestors of these Pueblo tribes, or a race of kindred habits, filled most of that vast region which is drained by the Colorado River and its affluents, and spread beyond into the valley of the Rio Grande. The explorers of a great extent of country in Utah, Arizona, New Mexico, and Colorado have found everywhere evidences of the wide distribution and wonderful industry of that ancient people. On the low land which they used to till lie the remains of their villages,—rectangular buildings of enormous dimensions and large circular *estufas*, or halls for council and worship. On the sides of the savage cliffs that wall in or overarch the cañons are scattered in every crevice and wrinkle those strange and picturesque ruins which give us the name "Cliff-dwellers" to distinguish this long-forgotten people. And on commanding points, seen far away down the cañons or across the mesas, stand the solitary

watch-towers where sentinels might signal to the villagers below on the approach of Northern barbarians. . . .

There is no other district which embraces in so small a compass so great a number and variety of the Cliff-dwellers' ruined works as the cañon of the Little Rio Mancos in Southwestern Colorado. The stream rises in a spur of the San Juan Mountains, near the remote mining-camp called Parrott City. Flowing southward for a few miles through an open valley, it is soon enclosed between the walls of a profound cañon which cuts for nearly thirty miles through a table-land called the Mesa Verde. The cañon is wide enough to have permitted the old inhabitants to plant their crops along the stream, and the cliffs rising on either side to a height of two thousand feet are so curiously broken and grooved and shelving, from the decay of the soft horizontal strata and the projection of the harder, as to offer remarkable facilities for building fortified houses hard of approach and easy of defence. Therefore the whole length of the cañon is filled with ruins, and for fifteen miles beyond it to the borders of New Mexico, where the river meets the Rio San Juan, the valley bears many traces of the ancient occupation.

The scenery of the cañon is wild and imposing in the highest degree. In the dry Colorado air there are few lichens or weather-stains to dull the brightness of the strata to the universal hoariness of moister climates: the vertical cliffs, standing above long slopes of débris, are colored with the brilliant tints of freshly-quarried stone. A gay ribbon of green follows the course of the rivulet winding down through the cañon till it is lost to sight in the vista of crags. The utter silence and solitude of the wilderness reigns through the valley. It is not occupied by any savage tribe, and only a few white men within the last few years have passed through it and told of its won-

ders; and yet its whole length is but one series of houses and temples that were forsaken centuries ago. I can hardly imagine a more exciting tour of exploration than that which Mr. Jackson's party made on first entering this cañon in 1874.

Above the entrance of the cañon the evidences of prehistoric life begin. On the bottom-land, concealed by shrubbery, are the half-obliterated outlines of square and circular buildings. The houses were of large size, and were plainly no temporary dwelling-places, for an accumulation of decorated pottery fills the ground about them, indicating long occupation. No doubt they were built of adobe,—masses of hard clay dried in the sun,—which the wear of ages has reduced to smoothly-rounded mounds. For some miles down the cañon remains of this sort occur at short intervals, and at one point there stands a wall built of squared sandstone blocks. Along the ledges of the cliffs on the right bits of ruinous masonry are detected here and there, but for a time there is nothing to excite close attention. At last a watchful eye is arrested by a more interesting object perched at a tremendous height on the western wall of the cañon. It is a house built upon a shelf of rock between the precipices, but, standing seven hundred feet above the stream and differing not at all in color from the crags about it, only the sharpest eyesight can detect the unusual form of the building and the windows marking the two stories.

The climb up to the house-platform is slow and fatiguing, but the trouble is repaid by a sight of one of the most curious ruins on this continent. Before the door of the house, part of the ledge has been reserved for a little esplanade, and to make it broader three small abutments of stone, which once supported a floor, are built on the sloping edge of the rock. Beyond this the house is

entered by a small aperture which served as a door. It is the best specimen of a Cliff-dweller's house that remains to our time. The walls are admirably built of squared stones laid in a hard white mortar. The house is divided into two stories of three rooms each. Behind it a semicircular cistern nearly as high as the house is built against the side of it, and a ladder is arranged for descending from an upper window to the water-level. The floor of the second story was supported by substantial cedar timbers, but only fragments of them remain. The roof, too, has entirely disappeared, but the canopy of natural rock overhanging serves to keep out the weather. The front rooms in both stories are the largest and are most carefully finished. Perhaps they were the parlor and "best bedroom" of some prehistoric housewife. They are plastered throughout with fine smooth mortar, and even in that remote age the mania for household decoration had a beginning: floor, walls, and ceiling were colored a deep red, surrounded by a broad border of white.

The same cliff on which this house stands has on its side many other ruins; some half destroyed by gradual decay, some crushed by falling rocks, none so perfect as the one described; but all are crowded into the strangest unapproachable crevices of the cañon-wall, like the crannies which swallows choose to hold their nests, far removed from the possibility of depredation. Some are so utterly inaccessible that the explorers, with all their enthusiasm and activity, have never been able to reach them. How any beings not endowed with wings could live at such points it is hard to conceive: it makes one suspicious that the Cliff-dwellers had not quite outgrown the habits of monkey ancestors.

As the cañon widens with the descent of the stream, the ruins in the western wall increase in number. One fear-

ful cliff a thousand feet in height is chinked all over its face with tiny houses of one room each, but only a few of them can be detected with the naked eye. One, which was reached by an explorer at the peril of his life, stands intact: ceiling and floor are of the natural rock, and the wall is built in a neat curve conforming to the shape of the ledge.

A mile farther down the stream there is a most interesting group of houses. Eight hundred feet above the valley there is a shelf in the cliff sixty feet in length that is quite covered by a house. The building contains four large rooms, a circular sacred apartment and smaller rooms of irregular shape. It was called by its discoverers "The House of the Sixteen Windows." Behind this house the cliff-side rises smooth and perpendicular thirty feet, but it can be scaled by an ancient stairway cut into it which ascends to a still higher ledge. The stairs lead to the very door of another house filling a niche a hundred and twenty feet long. A great canopy of solid rock overarches the little fortress, reaching far forward beyond the front wall, while from below it is absolutely unapproachable except by the one difficult stairway of niches cut in the rock. In time of war it must have been impregnable. These dwellings have given more ideas about their interior furnishing than any of the others. Among the accumulated rubbish were found corn and beans stored away. In the lower house were two large water-jars of corrugated pottery standing on a floor covered with neatly-woven rush matting. In a house not far above were found a bin of charred corn, and a polished hatchet of stone made with remarkable skill.

From this point onward both the valley and the cliffs are filled with the traces of a numerous population, every mile of travel bringing many fresh ones into sight. Among the cliff-houses there is of necessity a variety in form and

size as great as the differences of the caves and crevices that hold them; but among the buildings of the low ground there is more uniformity, not only in this cañon, but in all the valleys of the region. Most of them may be classed as aggregated dwellings or pueblos with rectangular rooms, round watch-towers and large circular buildings. To these must be added a few which seem to have been built only for defence. The straight walls have generally fallen, except the parts supported by an angle of a building; but, as usual in old masonry, the circular walls have much better resisted decay.

About midway down the cañon the curved wall of a large ruin rises above the thicket. It is a building of very curious design. The outer wall was an exact circle of heavy masonry a hundred and thirty feet in circumference. Within, there is another circular wall, concentric with the outer, enclosing one round room with a diameter of twenty feet. The annular space between the two walls was divided by partitions into ten small apartments. Other buildings of the same type occur in this region, some of much larger size and with triple walls. Even in this one, which is comparatively well preserved, the original height is uncertain, though the ruin still stands about fifteen feet high.

The vast quantity of débris about some of them indicates that they were of no insignificant height, and their perfect symmetry of form, the careful finish of the masonry, the large dimensions and great solidity, made them the most imposing architectural works of that ancient people. I find no reason to doubt that they were their temples, and the presumption is very strong that they were temples for sun-worship. The occurrence of a circular room in connection with nearly every group of buildings is of special interest, as seeming to link the Cliff-

dwellers to the modern Pueblo tribes in their religious customs.

Most striking and picturesque of all the ruins are the round watch-towers. On commanding points in the valley, and on the highest pinnacles of the cliffs overlooking the surface of the mesa, they occur with a frequency which is almost pathetic as an indication of the life of eternal vigilance which was led by that old race through the years, perhaps centuries, of exterminating warfare which the savage red men from the North waged upon them. To us the suffering of frontier families at the hands of the same blood-thirsty savages is heartrending. What was it to those who saw year by year their whole race's life withering away, crushed by those wild tribes?

Near the lower end of the cañon stands one of the most perfect of these towers, rising sixteen feet above the mound on which it is built. It was once attached to an oblong stone building which seems to have been a strongly-fortified house. The rectangular walls, as usual, are prostrate, and have left the tower standing as solitary and picturesque and as full of mystery as the round towers of Ireland. . . .

In the Montezuma Cañon, just beyond the Colorado State border, there are some remains built after an unusual manner with stones of great size. One building of many rooms, nearly covering a little solitary mesa, is constructed of huge stone blocks not unlike the pre-historic masonry of Southern Europe. In the same district there is a ruined line of fortification from which the smaller stones have fallen away and are crumbling to dust, leaving only certain enormous upright stones standing. They rise to a height of seven feet above the soil, and the lower part is buried to a considerable depth. Their resemblance to the hoary Druidical stones of Carnac and Stonehenge is striking, and

there is nothing in their appearance to indicate that they belong to a much later age than those primeval monuments of Europe.

All the certain knowledge that we have of the history and manners of the Cliff-dwellers may be very briefly told, for there is no written record of their existence, except their own rude picture-writing, cut or painted on the cañon walls, and it is not likely that those hieroglyphics will ever be deciphered. But much may be inferred from their evident kinship to the Moquis of our time; and the resemblance of the ancient architecture and ceramics to the arts as they are still practised in the degenerate pueblos of Arizona gives us many intimations in regard to the habits of the Cliff-dwellers.

It was centuries ago—how long a time no one will ever know—when that old race was strong and numerous, filling the great region from the Rio Grande to the Colorado of the West, and from the San Juan Mountains far down into Northern Mexico. They must have numbered many hundreds of thousands, perhaps millions. It is not probable that they were combined under one government, or that they were even closely leagued together, but that they were essentially one in blood and language is strongly indicated by the similarity of their remains. That they were sympathetic in a common hostility to the dangerous savage tribes about them can hardly be doubted. They were of peaceful habits and lived by agriculture, having under cultivation many thousands of acres in the rich river-bottoms, which they knew well how to irrigate from streams swollen in summer by the melting snows of the high mountain-ranges. We read of their dry canals in Arizona, so deep that a mounted horseman can hide in them. We know that they raised crops of corn and beans, and in the south cotton, which they skilfully wove. That

GRAND CAÑON, ARIZONA

IN THE COUNTRY OF THE CLIFF-DWELLERS

they had commercial dealing across their whole country is shown by the quantity of shell-ornaments brought from the Pacific coast, which are found in their Colorado dwellings. They did not understand the working of metals, but their implements of stone are of most excellent workmanship. Their weapons indicate the practice of hunting, and while the race was still numerous their forts and their sharp obsidian arrows made easy their resistance to the wandering savage hordes.

I believe that no instance can be cited of a people still in their Stone Age who have surpassed that old race in the mason's art: indeed, I doubt if any such people has even approached their skill in that respect. The difficulty of constructing a great work of well-squared, hammer-dressed stones is enormously increased if the masons must work only with stone implements. Imagine the infinite, toilsome patience of a people who in such a way could rear the ancient Pueblo Bonito of New Mexico, five hundred and forty feet long, three hundred and fourteen feet wide, and four stories high! In one wall of a neighboring building of stone less carefully dressed it is estimated that there were originally no less than thirty million pieces, which were transported, fashioned, and laid by men without a beast of burden or a trowel, chisel, or hammer of metal. . . .

At the time of the Spanish conquest the Pueblo tribes were worshippers of the sun and fire, like all the races of this continent which were above barbarism. To-day, even in those pueblos where a corrupted form of the Roman faith is accepted, there are traces of the old sun-worship mingled with it, and in all pueblos there are large circular rooms, called estufas, reserved for councils and for worship. The invariable appearance of estufas among the ruined towns, and even on the ledges of the cliffs, shows what

sacredness was attached to the circular room, which, perhaps, was symbolic of the sun's orb: it indicates a unity of religious faith between the ancients and moderns.

LAKE TAHOE AND THE BIG TREES.

A. H. TEVIS.

[To Rev. A. H. Tevis, author of "Beyond the Sierras; or, Observations on the Pacific Coast," we owe the following description of a most charming example of American lake scenery, one of the varied and striking regions of beauty which California offers to the tourist.]

OF the many curiosities that nature has scattered over the length and breadth of this coast, Lake Tahoe is one of the most charming.

This is a land of wonders, certainly of curiosities. Providence has made this vast area, between the Rocky Mountains and the sea, his chief receptacle of the wealth of the country. And what folly to travel in foreign countries to see the sights until you have at least seen some of the wonders and treasures of our own great Commonwealth! You can spend your life in exploring these various wonders, and then not find an end,—petrified forests; lost rivers, whose *termini* no one knows, and of whose source there is great doubt; brackish lakes, whose waters are worse than the Dead Sea, and in which no living thing can exist; bubbling, hissing, thundering geysers, whose awfulness impresses the hardest heart; roaring cataracts, that with a band of silver seem to bind together earth and sky; boiling springs, hither and yon in almost countless profusion, that send their breath of steam as through the throats of some great furnace from Vulcan's forge; geo-

graphical and topographical features that are marvellous in themselves; the big trees, whose magnitude is a wonder, and whose age links the present almost to the days of Solomon; Yosemite, unlike anything of the kind in the known world, whose sublimity is beyond description; and charming, silvery, unique Tahoe, or Pearl of the Sierras.

There is no patent on the name, hence we have chosen to christen it thus. And who will say it is a misnomer that has seen its grandeur and enjoyed the beauty of its surroundings? Its name belongs to the Indian tongue, and signifies *clear water.*

This lake in its greatest length is twenty-three miles, and greatest width eleven miles; hence it has an area of two hundred and fifty-three square miles. Its altitude is six thousand two hundred and twenty feet above the level of the sea. Here, spread out before me, like the finest of burnished silver, is a lake unlike any other body of water in the world, save one in Switzerland, and that has only a few marks of similarity.

This lies nestled away, like a very jewel, in the summit of the Sierras,—the Alps of America,—at an altitude of a mile and a quarter above the level of the sea. Think of it! A body of water containing an area of more than two hundred and fifty square miles, and deep enough to float the largest vessel that ever traversed the sea, and then have almost immeasurable depths below the keel; think of this being in the very summit of the greatest range of mountains in America!

It has been sounded along the line between Nevada and California, which runs through the lake, to the distance of two hundred and fifty-three fathoms, or fifteen hundred and eighteen feet. But other places have been sounded to the great distance of nearly twenty-five hundred feet. The character of the water is almost incredible to one who has

never looked upon it. Coming down from the springs that burst from the cañons, and the everlasting snows that crown the mountain-tops, where

"'Tis the felt presence of the Deity,"

the water is almost perfectly pure.

I have leaned over the side of the boat and watched the play of the trout a *hundred and fifty feet* below the surface. I have dropped a small, shining, metallic button, and watched distinctly its oscillations in sinking for three or four minutes.

The transparent nature of the water is best seen in the morning, when the lake is perfectly calm; not even the small surface ripples that nearly always exist on ordinary streams and lakes are visible.

The various angles of vision present the most charming scene. Yonder the lake looks like a quiet mass of molten silver; yonder, where the rays of the sun meet you, is a gorgeous array of crimson and gold; then there is a range of purest emerald, deepening into blue-black as the scene stretches away from you, bespangled in the distance by the rising white-caps. This, fringed with the green of the deep pine-forests that skirt the mountains, and capped with the everlasting snows, made radiant with the flood of sunlight, furnishes a picture of incomparable beauty, and worthy of a master's brush.

But here by you, right at your feet, is one of the most pleasing features of all: so still in the morning quietness, and such air-like purity withal. You think you can reach down and pick up those shining pebbles, and yet they are twenty, thirty, or forty feet beneath you. And that boat or skiff seems to be poised in mid-air. You can count the small indentures and nail-heads in the very keel.

You cringe with fear as your boat glides towards that huge boulder, as large as a church, thinking surely your

vessel will be wrecked; but there is no danger, as the rock is many feet beneath you. The transparency of the water makes the danger seem so near.

How often have I wished this place—mountains, lake, and all—could be the place of one of the grand Eastern camp-meetings! This bracing air, this unique spot, this wonderful lake, this rich, healthful aroma of deep pine-forests, this grand scenery, all combined, make it one of the best of places for religious summer resort.

Yonder is a quaint spot, a veritable Gibraltar on a small scale, a lonely, rocky island in the centre of Emerald Bay. Some foolish man built a tomb in the solid rock on its summit, intending to be buried there, where the marks of decay would come slowly over his grave, and where he might sleep undisturbed amid the incomparable grandeur that would have surrounded him. His sarcophagus and all were prepared, but the treacherous billows of the lake, that occasionally foam and roar with fury, seized him, and he lies buried at the bottom,—no man knows where, for no one going down ever comes up again from these waters.

It was first an artless, genial party of three of us that drank in the poetry of the scenery around Lake Tahoe. The "elect lady," whose presence has ever been an inspiration and encouragement in life's blackest, bitterest hours, her best and dearest friend, Miss Torreyson, and the writer, made up the trio. We were joined by and by with a party of others kindred in spirit, who entered into all our schemes and reconnoissances after pleasure.

Those were memorable six weeks; and now, at this distance of many months on the road of time, that period of frolic and recuperation gleams as with the radiance of youth's happiest sunset scene. How strange that happy days even never look so charming as when they are mellowed in the deep past! . . .

During the days we enlivened many a bright morning hour with boat-riding, fishing, gathering wild-flowers, and such other amusements as this delightful place afforded. On one of these fishing excursions one of our party came very near falling into the treacherous waters of the lake.

Our favorite resorts, and it is so with all tourists, were Emerald and Carnelian Bays. The former is a beautiful, land-locked arm of the lake, walled in by rugged and towering cliffs. The latter is a long, gravelly beach, where by the hour we have searched for carnelian stones, of which some of the purest quality are found.

The mountains and cañons are most delightful points of interest as places of observation and rest, and often charm by the echoes they throw back. We were given to song; and many a time summering here, and travelling over the lake, we united in singing the "Evergreen Mountains of Life" and "A Thousand Years," our favorite lake airs; the former suggested, no doubt, by the towering mountains that surrounded us. The effect is peculiarly fascinating, as the song rings out over the waters, in the pure mountain air, and echoing dies away, after many reverberations of "evergreen mountains of life"—"mountains of life"—"life"—in some deep cañon. Or "a thousand years, Columbia,"—"years, Columbia,"—"Columbia," —the vowels of the last becoming beautifully distinct in the echoes.

Nearly south of the head of Lake Tahoe, a distance of perhaps a mile and a half, is a little lake that bears the name of Fallen Leaf; and then to the west of this some three miles is Cascade Lake, as charming a little body of water as ever flashed back the sunlight. Of all the objects of interest here, none of its kind is more interesting than this delightful lake, that spreads itself out a half-mile by a

mile and a half, and that at an altitude of four or five hundred feet above Tahoe.

Above this, from the summit of Tallac Mountain, it is positively asserted *seventeen* lakes, varying in size, can be seen at one glance nestled away like a cluster of diamonds in the bosom of the Sierras. All these lakes abound with the finest of trout, and are surrounded by the best of game.

On the east side of Tahoe are Cave Rock and Shakespeare Rock. The former is a bald precipitous peak, that presses its perpendicular side almost to the water's edge, leaving just room enough for the road of the old overland stage-coach. Under this rock is a cave of small pretensions, but with the wild scenery, the bald, dizzy height of the cliff, and the fine view of the lake, it is one of the many frequented places.

Shakespeare Rock stands back perhaps full half a mile from the landing at Pray's Bay, or Glenbrook. It is a perpendicular cliff of well on towards a thousand feet above the waters of the lake. It has its name from a well-defined portrait of a man, moss-formed or wind-chiselled, doubtless, that is seen plainly several hundred feet up the rugged side. It is said to look very much like the old bard of Stratford-upon-Avon. But of this we cannot say; we never saw him.

It was on one of Nature's brightest days that our trio, lunch-armed, toiled up its rugged side, the only accessible point, and flung our handkerchief banners to the breeze from the improvised flag-staff, while we grew enraptured at the rich perspective from the dizzy height. It seemed almost like being on "cloud's rest" as some cloud's shadow fell upon us while there.

Below us lay the bustling, thriving village of Glenbrook, having, perhaps, well on towards a thousand souls as the

number of its inhabitants; increased by tourists, and, of course, largely diminished in the winter months, when business here "shuts down." The temperature, however, is generally fine from the last of April to the first of November, or even later. It is not unpleasant now, as I write,—the middle day of January,—to be out boat-riding or rambling by the shore.

This is the outlet of the entire lake and its surroundings; an immense traffic in lumber, etc., is carried on. Five saw-mills give life and activity to the place, as they cut nearly three hundred thousand feet per day, or more than fifty millions during the business months of the year. A hotel, store, post-office, with daily mail, and telegraph-office, add to the convenience of the place. There are six steamers on the lake that run for pleasure-parties and traffic.

From the lake one of the most unique railroads ever built runs to the summit, a distance of nine miles by the route travelled, although the distance by an air line is but three, while the elevation that it gains is eight hundred and fifty feet. It climbs the mountain by zigzag movements, like a letter Z, the engine sometimes hauling its burden, and sometimes pushing the train. More than a quarter of a million of dollars were required to build and stock this novel short line. It is a rare evidence of engineering skill, and certainly is a good illustration of Western enterprise. It lacks at least a dozen miles of connecting with any other railroad point, and its engines, rolling-stock, etc., had to be hauled up the mountain eight thousand feet high.

[To this description of the liquid marvel of California we add the author's account of one of its land marvels, a grove of the "big trees," the vegetable giants of the world.]

The Big Trees, as they are technically called, are of a light, bright cinnamon color, and have a diameter at the ground of from twenty-five to forty feet, a height of from three hundred to four hundred and fifty feet, and a bark that will average one foot and a half in thickness where it has not been molested. I have seen blocks of bark that would measure thirty-two inches in thickness, and I have no doubt but some trees have bark that would average nearly three feet. The texture is loose and spongy, and when cut transversely it is often worked into pincushions and such like toys. The wood is light as the cedar, but is susceptible of a very fine polish. I had a cane made from a piece that I bought of the guide, and I found it would polish equal to mahogany. The Mariposa grove is a State park, together with Yosemite Valley, given by the United States government.

This grove, "together with the Yosemite Valley with its branches and spurs, an estimated length of fifteen miles, and in average width one mile back from the edge of the precipice on each side of the valley, with the stipulation, nevertheless, that the State shall accept this grant on the express condition that the premises shall be held for public use and recreation, and shall be inalienable for all time." So it is absolutely impossible to get a bit of bark or piece of wood except from the guide, who is allowed to gather them from the outskirts of the grove from a tree that has fallen or one that stands outside of the prescribed limits.

There has but one fallen, however, since their discovery, and that was felled by men's hands. It was done by immense augers. It took five men twenty-two days to fell the tree, equal to the services of one man for *one hundred and ten days.* Think of that, nearly four months' work, not counting any time lost by Sundays, or rainy days, or sickness, to fell one tree! That tree would have yielded

more than a thousand cords of four-foot wood and a hundred cords of bark, more than eleven hundred cords altogether. On the stump of this tree there is a house—"whose foundation is sure"—thirty feet in diameter. This house contains room enough in square feet, if it were the right shape, for a parlor twelve by sixteen, a dining-room ten by twelve, a kitchen ten by twelve, two bedrooms ten feet square each, a pantry four by eight feet, two clothes-presses one and a half feet deep and four feet wide, and still have a little to spare.

The foliage of these trees resembles the cedar somewhat. They bear a cone not more than two inches in length, and a black pitch bitter as gall. The forests at present have a gloomy appearance, as some time in the past, no one knows when, the Indians, the better to facilitate their hunting, burned off the chaparral and rubbish, and, as a matter of course, disfigured the trees by burning off nearly all the bark.

The first sight of these monarchs is one of sore disappointment. For you have travelled many miles where the trees are all large, and here, surrounded as they are by immense pines, their magnitude is not appreciated. But their greatness grows very rapidly upon you, so that if there was at first disappointment, there is now a greater awe. Our first view of interest was the Fallen Monarch, a ponderous old trunk stretched out upon the ground for more than two hundred feet, upon which a stage and four horses could be driven with ease. We had to go a hundred feet towards the top to climb upon the trunk. The diameter of this tree, without bark, at the base is twenty-two feet; one hundred feet from the root it is twelve feet.

How long this monarch has been sleeping no one pretends to know. The guide says it is no more decayed now, to all appearances, than it was when first discovered. The tree of greatest interest is the Grizzly Giant, which has

an altitude of more than three hundred feet. The first thing we did to try its magnitude was to surround it on horseback, passing around in single file, the head of one horse to the tail of another. It called into requisition twenty-five horses out of the twenty-eight in our party to complete the measurement. This is not considered strictly correct, mathematically speaking, but it indicates the size of the tree by *horse measurement.*

I had prepared myself with a good-sized string, and, with the help of a friend, made close calculation four feet from the ground, and found it to be ninety-three feet, giving a diameter of thirty-one feet. This tree has a limb one hundred feet from the ground that is six feet in diameter. These trees stand around us in quiet grandeur, but to write of one is to write of many, hence the reader must not be wearied with a notice of each. Pluto's Chimney is a hollow tree, standing upright, into which several of us rode on horseback. Yonder is another that had fallen in some past age, and sixty feet or more of it had burned from the root upward, and then towards the top had burned in two, leaving a barrel-shaped or hollow part of the trunk some fifty feet in length. Through this we all rode without any inconvenience. I have understood that several have ridden abreast through it, which I do not think improbable.

This completed our tour among these forest giants. There are two groves—and, properly speaking, but two—of these *Sequoia gigantea*, the Mariposa and Calaveras groves. The first is about twenty miles south of Yosemite Valley, perhaps a little more, while the latter is some fifty miles northwest of the valley. Thus it will be seen that they are not, as many suppose, in the great Yosemite Valley.

The big trees of California, not of this species, however, are not confined to these two groves. Many of the noted

redwood species (*Sequoia sempervirens*) used to grow back of Santa Cruz, many of which are standing yet that were very great in size. We once upon a time, with five others, rode into one of these during a storm. The butt was hollow, and large enough to hold at least twelve men on horseback, and was not less than two hundred and fifty feet in height.

THE CHINESE QUARTER IN SAN FRANCISCO.

HELEN HUNT JACKSON.

[We need not tell who Helen Hunt Jackson is. She is well known to American readers both of verse and prose for her excellent ability in both these fields of literature. Born in 1831, at Amherst, Massachusetts, the daughter of Professor N. W. Fiske, she married first Mr. Hunt, of the United States Engineer Corps, and after his death a Mr. Jackson. She died in 1885. From her work entitled "Bits of Travel at Home," a series of racy sketches of experience east and west, we extract her narrative of the odd and amusing things she saw in the Chinese quarter of San Francisco.]

SING, WO & CO. keep one of the most picturesque shops on Jackson Street. It is neither grocer's, nor butcher's, nor fishmonger's, nor druggist's; but a little of all four. It is like most of the shops on Jackson Street, part cellar, part cellar-stairs, part sidewalk, and part back bedroom. On the sidewalk are platters of innumerable sorts of little fishes,—little silvery fishes; little yellow fishes, with whiskers; little snaky fishes; round flat fishes; little slices of big fishes,—never too much or too many of any kind. Sparing and thrifty dealers, as well as sparing and thrifty consumers, are the Celestials. Round tubs of sprouted beans; platters of square cakes of something whose consistency was like Dutch cheese, whose color was vivid

yellow, like baker's gingerbread, and whose tops were stamped with mysterious letters; long roots, as long as the longest parsnips, but glistening white, like polished turnips; cherries, tied up in stingy little bunches of ten or twelve, and swung in all the nooks; small bunches of all conceivable green things, from celery down to timothy grass, tied tight and wedged into corners, or swung overhead; dried herbs, in dim recesses; pressed chickens, on shelves (those were the most remarkable things. They were semi-transparent, thin, skinny, and yellow, and looked almost more like huge, flattened grasshoppers than like chickens; but chickens they were, and no mistake),—all these were on the trays, on the sidewalk, and on the cellar-stairs.

In the back bedroom were Mrs. Sing and Mrs. Wo, with several little Sings and Wos. It was too dark to see what they were doing; for the only light came from the open front of the shop, which seemed to run back like a cave in a hill. On shelves on the sides were teacups and teapots, and plates of fantastic shapes and gay colors. Sing and Wo were most courteous; but their interest centred entirely on sales; and I could learn but one fact from them in regard to any of their goods. It was either "Muchee good. Englis man muchee like," or else, "China man like; Englis man no like." Why should I wish to know anything further than that some articles would be agreeable to "Englis man's" palate, and others would not? This must be enough to regulate my purchases. But I shall always wish I knew how those chickens were fattened and what the vivid yellow cakes were made of.

[Next our traveller looks into the shop of Ty Wing & Co., where nothing appears but darkness, dust and cobwebs, and two Chinese women eating something unknown with chopsticks; that of Chick Kee, a druggist, with feathers and banners without and nothing but

old dried roots visible within; and of Tuck Wo, a restaurant-keeper, where nothing is visible that she has the courage to taste.]

Moo, On & Co. come next. Their shop is full, crowded full,—bags, bundles, casks, shelves, piles, bunches of utterly nondescript articles. It sounds like an absurd exaggeration, but it is literally true, that the only articles in his shop which I ever saw before are bottles. There are a few of those; but the purpose, use, or meaning of every other article is utterly unknown to me. There are things that look like games, like toys, like lamps, like idols, like utensils of lost trades, like relics of lost tribes, like—well, like a pawnbroker's stock, just brought from some other world. That comes nearest to it.

Moo, On & Co. have apparently gone back for more. Nobody is in the shop; the door is wide open. I wait and wait, hoping that some one will come along who can speak English, and of whom I may ask what this extraordinary show means. Timidly I touch a fluttering bit, which hangs outside. It is not paper; it is not cloth; it is not woollen, silk, nor straw; it is not leather; it is not cobweb; it is not alive; it is not dead; it crisps and curls at my touch; it waves backward, though no air blows it. A sort of horror seizes me. It may be a piece of an ancestor of Moo's doing ghostly duty at his shop door. I hasten on and half fancy that it is behind me, as I halt before Dr. Li Po Tai's door. His promises to cure, diplomas, and so forth, are printed in gay-colored strips of labels on each side. Six bright balloons swing overhead; and peacocks' feathers are stuck into the balloons. I have heard that Dr. Li Po Tai is a learned man, and works cures. His balloons are certainly very brilliant. . . .

Then comes a corner stand, with glass cases of candy. Almond candy, with grains of rice thick on the top; little bowls of pickles, pears, and peppers; platters of odd-shaped

nuts; and beans baked black as coffee. As I stand looking curiously at these, a well-dressed Chinaman pauses before me, and making a gesture with his hand towards the stand, says, "All muchee good. Buy eat. Muchee good." Hung Wung, the proprietor, is kindled to hospitality by this, and repeats the words, "Yaas, muchee good. Take, eat," offering me, with the word, the bowl of peppers.

Next comes a very gay restaurant, the best in the empire. Hang Fee, Low & Co. keep it, and foreigners go there to drink tea. There is a green railed balcony across the front, swinging full of high-colored lanterns, round and square; tablets with Chinese letters on bright grounds are set in panels on the walls; a huge rhinoceros stands in the centre of the railing: a tree grows out of the rhinoceros's back, and an India-rubber man sits at the foot of the tree. China figures and green bushes in flower-pots are ranged all along the railing. Nowhere except in the Chinese Empire can there be seen such another gaudy, grotesque house front. We make an appointment on the spot to take some of Hang Fee's tea, on our way to the Chinese Theatre, the next evening, and then we hurry home. . . .

After all, we did not take tea at Hang Fee's on our way to the theatre. There was not time. As it was, we were late; and when we entered the orchestra had begun to play. Orchestra! It is necessary to use that name, I suppose, in speaking of a body of men with instruments, who are seated on a stage, furnishing what is called music for a theatrical performance. But it is a term calculated to mislead in this instance. Fancy one frog-pond, one Sunday-school with pumpkin whistles, one militia training, and two gongs for supper on a Fall River boat, all at once, and you will have some faint idea of the indescribable noise which saluted our ears on entering that theatre. To say

that we were deafened is nothing. The hideous hubbub of din seemed to overlap and transcend all laws and spheres of sound. It was so loud we could not see; it was so loud we could not breathe; it was so loud there did not seem to be any room to sit down! The theatre was small and low and dark. The pit and greater part of the gallery were filled with Chinamen, all smoking. One corner of the gallery was set aside for women. That was full, also, with Chinese women. Every woman's hair was dressed in the manner I have described ["drawn back from her forehead, twisted tight from the nape of the neck to the crown of the head, stiffened with glue, glistening with oil, and made into four huge double wings, which stood out beyond her ears on either side. It looked a little like two gigantic black satin bats, pinned to the back of her head, or still more like a windmill gone into mourning."] The bat-like flaps projected so far on each side of each head that each woman seemed almost to be joined to her neighbors by a cartilaginous band; and, as they sat almost motionless, this effect was heightened.

The stage had no pretence of secrecy. It was hung with gay banners and mysterious labels. Tall plumes of peacock's feathers in the corners and some irregularly placed chairs were all the furniture. The orchestra sat in chairs at the back of the stage. Some of them smoked in the intervals, some drank tea. A little boy who drummed went out when he felt like it; and the fellow with the biggest gong had evidently no plan of operations at all except to gong as long as his arms could bear it, then rest a minute, then gong again.

"Oh, well," said we, as we wedged and squeezed through the narrow passage-way which led to our box, "it will only last a few minutes. We shall not entirely lose our hearing." Fatal delusion. It never stopped. The actors came out;

the play began; the play went on; still the hideous hubbub of din continued, and was made unspeakably more hideous by the voices of the actors, which were raised to the shrillest falsetto to surmount the noise, and which sounded like nothing in nature except the voices of frantic cats. . . .

At first, in spite of the deafening loudness of the din, it is ludicrous beyond conception. To see the superbly dressed Chinese creatures,—every one of them as perfectly and exquisitely dressed as the finest figures on their satin fans or rice-paper pictures, and looking exactly like them, —to see these creatures strutting and sailing and sweeping and bowing and bending, beating their breasts and tearing their beards, gesticulating and rushing about in an utterly incomprehensible play, with caterwauling screams issuing from their mouths, is for a few minutes so droll that you laugh till tears run, and think you will go to the Chinese Theatre every night as long as you stay in San Francisco. I said so to the friend who had politely gone with me. He had been to the performance before. He smiled pityingly, and yawned behind his hand. At the end of half an hour, I whispered, "Twice a week will do." In fifteen minutes more, I said, "I think we will go out now. I can't endure this racket another minute. But, nevertheless, I shall come once more, with an interpreter. I must and will know what all this mummery means."

The friend smiled again incredulously. But we did go again, with an interpreter; and the drollest thing of all was to find out how very little all the caterwauling and rushing and bending and bawling and sweeping and strutting really meant. The difficulty of getting an interpreter was another interesting feature in the occasion. A lady, who had formerly been a missionary in China, had promised to go with us; and, as even she was not sure of

being able to understand Chinese caterwauled, she proposed to take one of the boys from the missionary school, to interpret to her before she interpreted to us. So we drove to the school. Mrs. —— went in. The time seemed very long that we waited. At last she came back, looking both amused and vexed, to report that not one of those intelligent Christian Chinese would leave his studies that evening to go to the theatre.

"I suppose it is an old story to them," said I.

"Not at all," said she. "On the contrary, hardly a boy there has been inside the theatre. But they cannot bear to lose a minute from their lessons. Mr. Loomis really urged some of them; but it was of no use."

In a grocery store on Kearny Street, however, we found a clever young man, less absorbed in learning; and he went with us as interpreter. Again the same hideous din; the same clouds of smoke; the same hubbub of caterwauling. But the *dramatis personæ* were few. Luckily for us, our first lesson in the Chinese drama was to be a simple one. And here I pause, considering whether my account of the play will be believed. This is the traveller's great perplexity. The incredible things are always the only things worth telling; but is it best to tell them?

The actors in this play were three,—a lady of rank, her son, and her man cook. The play opened with a soliloquy by the lady. She is sitting alone, sewing. Her husband has gone to America; he did not bid her farewell. Her only son is at school. She is sad and lonely. She weeps.

Enter boy. He asks if dinner is ready.

Enter cook. Cook says it is not time. Boy says he wants dinner. Cook says he shall not have it. This takes fifteen minutes.

Mother examines boy on his lessons. Boy does not know them; tries to peep. Mother reproves; makes boy

kneel; prepares to whip; whips. Mother weeps; boy catches flies on the floor; bites her finger.

Enter cook to see what the noise means. Cook takes boy to task. Boy stops his ears. Cook bawls. Cook kneels to lady; reproves her also; tells her she must keep her own temper, if she would train her boy.

Lady sulks, naturally. Boy slips behind and cuts her work out of her embroidery frame. Cook attacks boy. Cook sings a lament, and goes out to attend to dinner; but returns in frantic distress. During his absence everything has boiled over; everything has been burned to a crisp. Dinner is ruined. Cook now reconciles mother and son; drags son to his knees; makes him repeat words of supplication. While he does this cook turns his back to the audience, takes off his beard carefully, lays it on the floor, while he drinks a cupful of tea.

This is all, literally all. It took an hour and a half. The audience listened with intensest interest. The gesticulations, the expressions of face, the tones of the actors, all conveyed the idea of the deepest tragedy. Except for our interpreter, I should have taken the cook for a soothsayer, priest, a highwayman and murderer, alternately. I should have supposed that all the dangers, hopes, fears, delights possible in the lives of three human beings were going on on that stage. Now we saw how very far-fetched and preposterous had probably been our theories of the play we had seen before, we having constructed a most brilliant plot from our interpretation of the pantomime.

After this domestic drama came a fierce spectacular play, too absurd to be described, in which nations went to war because a king's monkey had been killed. And the kings and their armies marched in at one door and out at the other, sat on gilt thrones, fought with gilt swords, tumbled each other head over heels with as much vigor

and just as much art as small boys play the battle of Bunker Hill with the nursery chairs on a rainy day. But the dresses of these warlike monarchs were gorgeous and fantastic beyond description. Long, gay-colored robes, blazoned and blazing with gold and silver embroidery; small flags, two on each side, stuck in at their shoulders, and projecting behind; helmets, square breastplates of shining stones, and such decorations with feathers as pass belief. Several of them had behind each ear a long, slender bird-of-Paradise feather. These feathers reached out at least three feet behind, and curved and swayed with each step the man took. When three or four of these were on the stage together, marching and countermarching, wrestling, fighting, and tumbling, why these tail feathers did not break, did not become entangled with each other, no mortal can divine. Others had huge wings of silver filigree-work behind their ears. These also swayed and flapped at each step.

Sometimes there would be forty or fifty of these nondescript creatures on the stage at once, running, gesticulating, attacking, retreating, howling, bowing, bending, tripping each other up, stalking, strutting, and all the while caterwauling, and all the time the drums beating, the gongs ringing, and the stringed instruments and the castanets and the fifes playing. It was dazzling as a gigantic kaleidoscope and deafening as a cotton-mill. After the plays came wonderful tumbling and somersaulting. To see such gymnastic feats performed by men in long damask night-gowns and with wide trousers is uncommonly droll. This is really the best thing at the Chinese Theatre,—the only thing, in fact, which is not incomprehensibly childish.

My last glimpse at the Chinese Empire was in Mr. Loomis's Sunday-school. I had curiosity to see the faces of the boys who had refused our invitation to the theatre.

As soon as I entered the room I was asked to take charge of a class. In vain I demurred and refused.

"You surely can hear them read a chapter in the New Testament."

It seemed inhuman as well as unchristian to refuse, for there were several classes without teachers, many good San Franciscans having gone into the country. There were the eager yellow faces watching for my reply. So I sat down in a pew with three Chinese young men on my right hand, two on my left, and four in the pew in front, all with English and Chinese Testaments in their hands. The lesson for the day was the fifteenth chapter of Matthew. They read slowly, but with greater accuracy of emphasis and pronunciation than I expected. Their patience and eagerness in trying to correct a mispronunciation were touching. At last came the end of the chapter.

"Now do you go on to the next chapter?" said I.

"No. Arx-play-in," said the brightest of the boys. "You arx-play-in what we rade to you."

I wished the floor of that Sunday-school chapel would open and swallow me up. To expound the fifteenth of Matthew at all; above all, to expound it in English which those poor souls could understand! In despair I glanced at the clock: it lacked thirty minutes of the end of school; at the other teachers: they were all glibly responding. Guiltily I said, "Very well. Begin and read the chapter over again, very slowly; and when you come to any word you do not understand, tell me, and I will try to explain it to you."

Their countenances fell. This was not the way they had usually been taught. But with the meekness of a down-trodden people they obeyed. It worked even better than I had hoped. Poor souls! they probably did not understand enough to select the words which perplexed them.

They trudged patiently through their verses again without question. But my Charybdis was near. The sixth verse came to the brightest boy. As he read, "Thus have ye made the commandment of God of none effect by your tradition," he paused after the word tradition. I trembled.

"Arx-play-in trardition," he said.

"What?" said I, feebly, to gain a second's more of time. "What word did you say?"

"Trardition," he persisted. "What are trardition? Arx-play-in."

What I said I do not know. Probably I should not tell if I did. But I am very sure that never in all my life have I found myself, and never in all the rest of my life shall I find myself, in so utterly desperate a dilemma as I was then, with those patient, earnest, oblique eyes fixed on me, and the gentle Chinese voice reiterating, "What are trardition?"

MARIPOSA GROVE AND YOSEMITE VALLEY.

CHARLES LORING BRACE.

[Our sketches of travel in America will not be complete without descriptive narratives relating to its great natural wonders, of which the United States possesses more examples than any other country on the globe. The present selection, therefore, from Brace's "The New West, or California in 1867–68," is devoted to a brief account of the monster trees of that State and the scenic marvels of the Yosemite Valley.]

THE great pleasure of the American continent will hereafter be the journey to the Yosemite. There is no one object of nature in the world, except Niagara, to equal it in attraction. Whenever the Pacific road brings the two

coasts within a fortnight of each other, innumerable parties will be made up to visit it. I have been tolerably familiar, by foot-journeys, with Switzerland, Tyrol, and Norway, and I can truly say that no one scene in those grand regions can compare equally, in all its combinations, with the wonderful Cañon of the Yosemite. It is a matter of congratulation, also, to me, that I saw it before any road, or coach, or rail-car had approached it. It ought not to be visited otherwise than as our party journeyed to it,—on horses winding in picturesque train over velvety trails, beneath the gigantic pines of the Sierras. . . .

Among all my many travelling experiences in various countries, I do not think I can ever forget the romance and the delicious beauty of that first night's ride towards the Yosemite. The trail was barely wide enough for two to ride abreast, winding under majestic pines, over mountains, and down wide, deep dells, each step of the horses springing elastic from soft pine-leaves. The sun soon set, and a magnificent moon arose, giving us at one time a broad belt of light over the path, and then leaving us to descend into a mysterious gulf of darkness, and then casting strange shadows and half-lights through the pine-branches over our procession of riders. As we penetrated farther into the forest we began to wind about beneath trees such as few of us had ever seen,—the superb sugar-pine, perhaps the most perfect tree in nature, here starting with a diameter of from seven to twelve feet, and mounting up with most symmetrical branches to the height say of Trinity Church spire (two hundred and fifty to two hundred and sixty feet); on the ends of its branches cones hanging a foot long. Sometimes we came forth from the forest for a few moments, and had grand glimpses of great mountain valleys, only partly revealed in the glorious moonlight. Most of the party were old travellers, and were rather impervious

to sensations, but we all agreed that this was a new one, and gave a most promising augury of the Yosemite excursion. After fourteen miles—an easy ride—we all reached Clark's Ranch at a late hour, ready for supper and bed.

[The next morning] we started at not too early an hour for a forest-ride to the Trees, Mr. Clark kindly guiding us. What may be called the avenue to these hoary monuments of antiquity lies through a gigantic forest of sugar-pines, themselves some two hundred to two hundred and fifty feet high; so that when you reach the mighty towers of vegetation you lose a little the sense of their vast height. I searched curiously as we rode through the forest for the conditions which should produce such monsters of growth. It must be remembered that the *Sequoia gigantea* is not found merely here, or at Calaveras and its neighborhood. There appears to be a belt of them running along the slope of the Sierras, about four thousand and five thousand feet above the sea-level, and as far south as Visalia. They are so plentiful near that place as to be sawed for lumber, though what so light a wood could be used for I can hardly think. In the neighborhood of the latter place the Indians report a tree, far in the forest, surpassing in grandeur anything ever seen; but thus far no white man has ever cast eyes on it. It is a mistake, too, to suppose the race wearing out. I saw, both here and in Calaveras, young giant *Sequoiæ*, beginning patiently their thousand years of growth with all the vigor of their grand ancestors; some of but four hundred years, mere youths, were growing splendidly. There are fewer young trees here than in Calaveras, because fire or some other cause has swept among the underbrush of all trees, and must have destroyed many of these burly saplings.

The Sequoia grows on mountain-slopes, where the slow wash of water, through ages, brings down minute particles

of fertilizing rocks, and the decayed vegetation of countless centuries, with the moisture of eternal springs, water and feed its roots. It enjoys a sun of the tropics without a cloud for six months, and has the balmy air of the Pacific, with incessant and gentle moisture, and a warm covering of snow for its winter. Beneath its roots, the ground never freezes. As has been well said, "It has nothing to do but grow;" and so with all the favorable conditions that nature can offer—air and sun and moisture—it pumps up its food from the everlasting hills, and builds up its slow, vegetable-like substance during century after century into a gigantic, symmetrical, and venerable pile, while nations begin and pass away beneath its shadow.

Think of lying under a tree beneath which the contemporary of Attila or Constantine might have rested, and which shall defy the storm, perhaps, when the present political divisions of the world are utterly passed away, and the names of Washington and Lincoln are among the heroes of a vague past.

But how to give an impression of its size! If my readers will imagine a Sequoia placed beside Trinity Church, he must conceive it filling up one of our largest dwelling-houses, say a diameter of thirty feet, with a circumference of ninety feet; the bark of this gigantic trunk will be light, porous, and reddish in color, with many scars upon it of fire (its great enemy); then, perhaps, at the height of the Trinity belfry (say one hundred feet), two opposing huge branches will protrude, it may be, themselves, of the size of large trees (say eight feet in diameter); these will be twisted and much broken; above them will come forth other heavy branches, which show the marks and blows of the storms of a thousand years or more, for the giant, so far above his fellows, meets a continual battering from the gales of the mountains.

There is no symmetry in his top, or delicacy and grace in his outline; he has battled and struggled with the storm for too many centuries to preserve an artistic appearance. He looks the giant of the forest, broad-rooted and strong-limbed, rough and weather-beaten, but defying snow and frost and hurricane for thousands of years, and still sheltering bird and beast and cattle beneath his grand shadow. . . .

We visited one big tree in Calaveras which had been blown over two years before. The enormous weight which each tree carries makes it more difficult to bear the gales, as it overtops the forest. Perhaps any ordinary wood, such as oak or maple, would increase the specific gravity, so that at three hundred feet high the leverage on the roots would be too great to bear any strain of a gale; but this wood is almost like cork,—lighter than any wood on the Eastern coast. The fall of this mighty tower, they say, was heard for miles around, and made the earth tremble. Where it fell it has buried its top deep in the ground, so that there is quite a ravine made by the blow in the earth. You strike the trunk where it is still a large tree, and then walk upon it some two hundred feet towards the roots. When you reach the roots you are upon a height equal to the roof of a moderate-sized house, and a fall from the trunk would be dangerous. You descend by a ladder.

If I recollect rightly, there were three hundred and sixty-five trees in this Mariposa Grove. I measured one trunk, broken off at the top, where it was a foot in diameter, which was about two hundred and ninety feet in length, and estimating thirty feet as the length of the part broken off, it must have been some three hundred and twenty feet high. We lunched near a "camp" of the Geological Survey, in the heart of the grove, lying on our backs beneath the gigantic canopies, and feeling like pigmies at the feet

of these giants. The younger trees were often wreathed with a strange, yellow, hanging moss. Our ladies were deeply interested in a remarkable flower which grew beneath the snow, a few patches of which still remained here in June. It was a blood-red flower of a fleshy-like substance, like the Pyrola, or "Dutchman's pipe," growing somewhat like a garden hyacinth. Its stems were clustered, from six to ten inches high, with long, erect scales, broader below and gradually narrower, and finally becoming bracts. The flowers were numerous, and occupied the upper half of the stem. It is the *Sarcodes sanguinea.*

[Leaving the Big Tree grove, the travellers made a farther ride of twenty-five miles through the Sierras to the Yosemite, the first view of which impressed them deeply.]

No aspect of nature I have ever looked upon, no sight of the desolate ocean, heaving and lashing in mighty surges beneath wintry storm, or sudden view of Alpine snow-peaks through rifts of black thunder-clouds, or glimpses of Norwegian coast-glaciers through the lulls of an Arctic gale, or even Niagara itself, was so full of the inspiration of awe as this first opening view of the Yosemite Cañon. All other scenes of grandeur and beauty must fade away in my memory when this vision is forgotten. Before the mighty powers which had shaped this tremendous gorge, and in presence of this scene of unspeakable and indescribable beauty and majesty, man and his works seemed to sink away to nothingness. . . . I almost felt as if I had known nothing of the cañon before, so surprising were the effects of coloring and shadow. It must be remembered we had struck the gorge on one of its lateral walls, say about four miles from its western end. There is no approach to it from below up the stream. As we lay on the edge of the cliff we gazed up a narrow green valley perfectly flat, from

a mile to half a mile wide, and winding, some six miles above, between enormous cliffs and precipices, a small, bright, sparkling stream in the middle, fringed with green grass or forest-trees. The wall, over the edge of which we were looking, was nearly three-quarters of a mile high, and far below, the oaks and willows and poplars and pines in the green intervale looked like little shrubs. On the other side, a short distance beyond, was the grand bluff of El Capitan, a sheer precipice of nearly four thousand feet, its light granite pile, in the evening light, the most majestic cliff that human eye has looked upon; beyond were other bluffs and precipices, pearly gray and purplish-white, with green fringes below, and dark archways or fantastic figures traced by shadows on their surface. There were buttresses, as of gigantic cathedrals, and archways such as might support hills of granite, and domes where a mountain was the substructure, and half domes, and peaks whose regular succession has given them the name of "Brothers," —all varying in color and shadow, incessantly, with the receding light; some with the delicious cool gray of the rock color; some white, with a reddish shade; others faint purple; others resplendent in pink and brilliant purple; while over their edges, giving a joyous life to the scene, rushed sparkling silver streams, in innumerable waterfalls, dashing into the green valley below. . . . But the scene was changing. Over the valley, the heavy shadow of El Capitan continually increased its gigantic breadth of shade; beyond him the "Arches," which, to be seen at that distance, must be a thousand feet in height, grew each instant more strongly marked, but still farther beyond to the east the North Dome and the Half Dome were golden and purple in the evening light, and yet beyond the still white peaks of the Sierras towered above in the pale blue.

On our side of the vast gorge the foot of the various precipices and cliffs was covered with detritus, making, near the bottom, a considerable slope, on which grew many evergreen trees.

On the other side there was one line of massive rock, which fell apparently plumb, without a break or curve, for nearly four thousand feet, and at its base, so hard was the material, there seemed no recent detritus at all. One could evidently touch the very bottom of the immense fall of rock. . . .

The form of the cañon is unique, nothing in Europe resembling it: the immense vertical walls rising so abruptly from the green vale; the peaks, too, which surround it, being original, even in the Sierras; the immense, inaccessible, concentric masses of granite,—domes, or half-domes, as if melted in some gigantic mould, and then, when cooled, left standing in the air.

One of the grandest and most beautiful objects in the valley was directly opposite our hotel, and its music never ceased, day or night,—the Yosemite Fall. The stream which bears this name heads about ten miles away, and then flows down, almost directly over the mighty precipice, into the valley below,—a depth of two thousand five hundred and fifty feet. At this time it is about thirty-five feet wide by two or three deep. The fall has almost the appearance of one grand shoot of water, but it has, in reality, three divisions: the first is a descent of fifteen hundred feet on a ledge (as it seems), though it is, in fact, a shelf of rock, a third of a mile broad; then follow a series of cascades for six hundred and twenty-five feet, and a final leap of four hundred. There is water enough now to give a bright, foaming, grand sweep of the whole cataract. It is certainly one of the most beautiful objects the human eye can ever gaze upon! We never wearied of riding

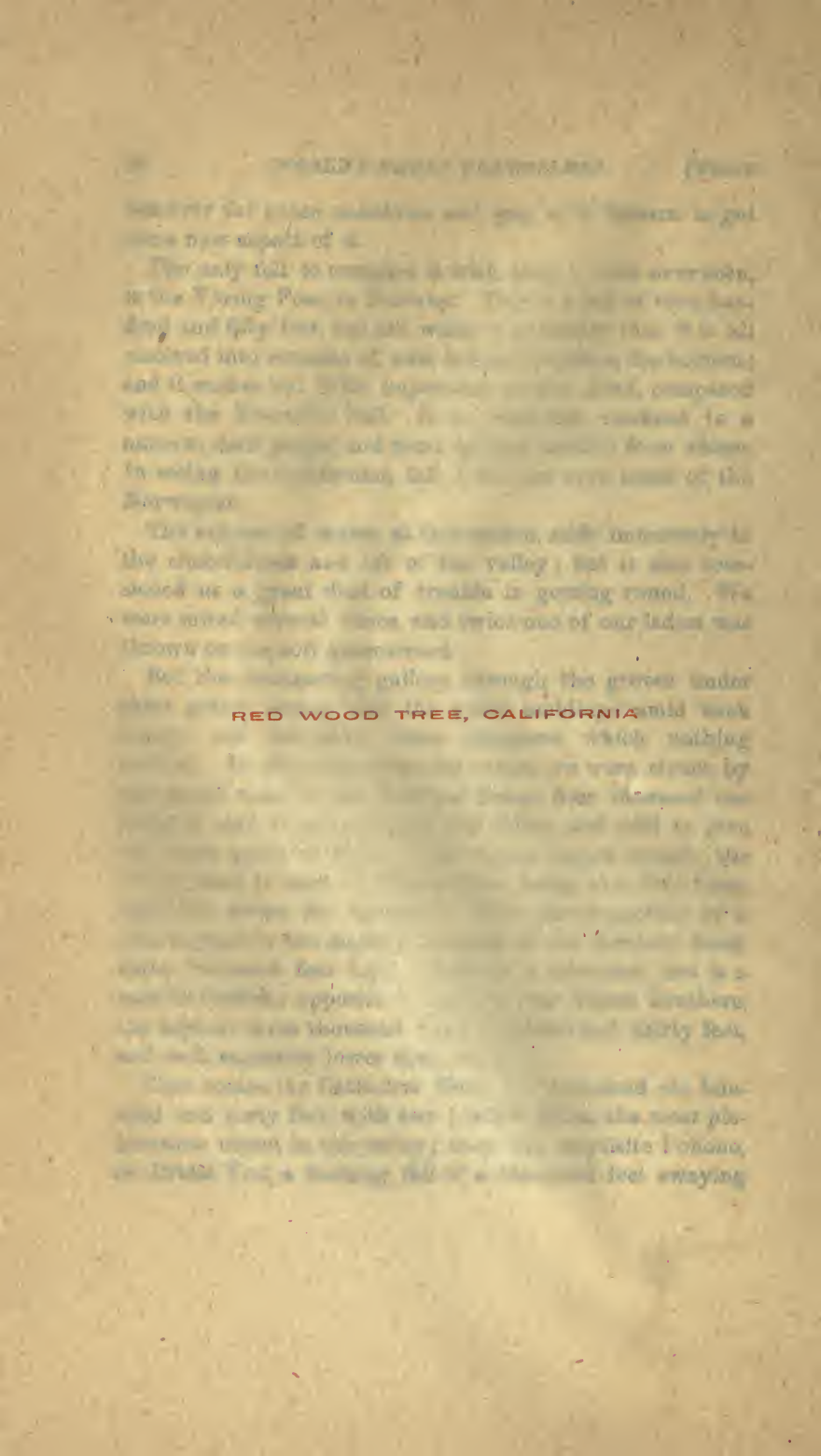
out over the green meadows and gay, wild flowers to get some new aspect of it.

The only fall to compare it with, that I have ever seen, is the Vöring Foss, in Norway. This is a fall of nine hundred and fifty feet, but the water is so scanty that it is all resolved into wreaths of mist before it reaches the bottom; and it makes but little impression on the mind, compared with the Yosemite Fall. It is, moreover, confined in a narrow, dark gorge, and must be seen usually from above. In seeing the Californian fall, I did not even think of the Norwegian.

The amount of water, at this season, adds immensely to the cheerfulness and life of the valley; but it also occasioned us a great deal of trouble in getting round. We were mired several times, and twice one of our ladies was thrown on the soft greensward.

But the scampering gallops through the groves under these grand scenes, and the quiet amblings amid such beauty and sublimity, were pleasures which nothing marred. In our rides down the cañon, we were struck by the grand mass of the Sentinel Dome, four thousand one hundred and fifty feet above the valley, and said to give the finest point of view in the whole region round; the valley itself, it must be remembered, being over four thousand feet above the sea-level. Then three-quarters of a mile beyond is the majestic buttress of the Sentinel Rock, three thousand feet high, of which a thousand feet is a smooth obelisk; opposite to this are the Three Brothers, the highest three thousand eight hundred and thirty feet, and each regularly lower than the next.

Then comes the Cathedral Rock, two thousand six hundred and sixty feet, with two perfect spires, the most picturesque object in the valley; then the exquisite Pohono, or Bridal Veil, a flashing fall of a thousand feet swaying



RED WOOD TREE, CALIFORNIA

like a silvery plume in the mountain breezes, and the grand feature of the gorge, of which I have so often spoken, El Capitan, three thousand six hundred feet.

To the east of the hotel, about two miles above the falls, the valley ends and divides into three cañons, each containing scenery as remarkable as those of the main gorge. The northwest cañon is the Tinaya Fork; here we have the Half Dome, a majestic inaccessible crest of concentric granite, four thousand seven hundred and thirty-seven feet above the valley, with a vertical face where the half sphere split off of two thousand feet in height; the North Dome, a rounded mass, three thousand five hundred and sixty-eight feet, and easy to ascend from the north. In this fork is the exquisite Tisayic Lake, on which the morning reflections are so beautifully given.

The middle cañon, that of the Merced River, is the most important one of the three. No ravine scenery in Europe equals this wild and extraordinary gorge. The river, which at this season has a tremendous body of water, descends through a wild ravine of two miles, nineteen hundred and eighty feet. The path winds along over a series of wild falls and rapids, till a cloud and gale of mist and wet cover it, through which we reach a dry place at the foot of a magnificent fall, four hundred and seventy-five feet high,—the Vernal. Then ladders are ascended up the face of the cliff, and we rest on the dry, sunny ledge over the boiling and whirling cataract. Still another scramble for a mile, and we find ourselves blinded, gasping, in the breath of the furious cataract above. We are all clad in India-rubber coats (furnished by a guide), and drip with water, and work up, inch by inch, stooping, as against a violent current. The gale takes away our breaths, and we have every now and then to catch a breath; there is nothing visible ahead but clouds of mist and driving swirls

of rain, with a roar filling the air, which prevents all voices from being heard. We are helping the ladies on with the utmost difficulty, but at last all reluctantly give out and turn back; but I cannot bear to give up the view; and after groping in the furious storm and mist, I at length find a side path through the chaparral, and soon reach a dry ledge beneath the superb Nevada Fall,—a majestic sweep of thundering water, six hundred and thirty-nine feet in height, more grand than any waterfall in the valley, because of the volume of water. There is a peculiar twist in the upper portion of it, which adds to its picturesque effect. On the other side rises a most remarkable peak of granite, solitary and inaccessible,—Mount Broderick, some two thousand feet. The scene as I stood there alone beneath this sublime sweep of waters, and amid those mighty mountain-cliffs, can never be forgotten.

The South Fork I did not visit, but the photographs show that it possesses scenery as romantic as the other branches of the cañon. It is interesting to notice that these enormous waterfalls in the Merced Cañon have scarcely an indentation on this most hard rock,—a fact probably indicating that they have not existed a great length of time. The comparative absence of detritus in the upper part of the main valley would seem to show the action of water and ice, pressing the débris into the lower portion, where more of it is found. There are, too (as was discovered by Mr. King), something which may be called lateral moraines, and perhaps a terminal moraine in the middle of the cañon, so that it seems not improbable, though there is no absolute evidence, that in a comparatively recent period glaciers existed in the upper part, and a lake in the body of the Yosemite Cañon, the descent of the whole valley, it must be remembered, being only fifty feet during some eight miles.

A SPORTSMAN'S EXPERIENCE IN MEXICO.

SIR ROSE LAMBERT PRICE.

[Major Price, whose hunting adventures seem to have extended from Terra del Fuego to the northern boundary of the United States, gives us, in his "Sport and Travel; or, The Two Americas," a record full of incident and observation. From his greatly varied hunting experience we select a description of the pursuit of game in the vicinity of Acupulco, Mexico, which is of interest as showing the conditions of animal and vegetable life in that region.]

THE day after our arrival, H—— and myself, getting mules and a guide, started for Pira de la Questa, a small Indian village about twelve miles from Acupulco, and situated near the extremity of a large lagoon, some thirty miles in circumference, which we were informed was full of wild fowl. Over many a rough road and in many lands have I ridden, but never did I travel a highway like unto this. The path ran over the mountains through a thick forest, and more resembled the bed of a watercourse than an actually connected route. Nothing but mules, whose cat-like propensities enable them to overcome apparently insurmountable difficulties, could possibly have done the journey. In places the path was so narrow that two of these animals were unable to pass abreast, so that one would be obliged to go back into a convenient corner, or scramble up a bank, to permit the other to go by.

The forest was dense, but, as it was just prior to the rains, almost leafless, everything being burned and parched up except in the valleys and bottoms of ravines, where running water rendered the vegetation luxuriant and flourishing. This absence of foliage, though detracting consider-

ably from the beauty of the forest, permitted us to view all the better its feathered denizens, and in few tropical countries have I seen such lovely birds, or in such numbers as out here. To classify or name them would require a man to be a perambulating encyclopædia of natural history; but among them all I was most struck with the number of specimens of the woodpecker class, several of which were very beautiful. One in particular with a blood-red topknot, which glittered vividly in the sun, I envied much for my fishing-book, and regretted the guide had my gun in his possession nearly a mile behind.

As the sun was setting we entered the village, which consisted of a few mud huts with sideless roofs, and halting before one of them, was informed by the guide that it was to be our quarters for the night. It was simply a roof of palm-leaves over a mud floor, there being no kind of wall or even screen, and it formed the universal dormitory of men, women, and children, pigs and poultry, at the principal hotel—the Claridge's, in fact—of Pira la Questa. Leaving the proprietress and her numerous progeny engaged in hunting down an active-looking fowl for our evening repast, we rode to the lagoon, and giving the guide our mules to hold, shot a few of the curious-looking aquatic birds, which he pronounced to be "buéno," or good for eating, that were feeding round the banks. It was rapidly getting dark, and seeing at a distance some birds that I took to be duck, I noiselessly crept down on them. To do so I had to pass over a small spot of white sand, concealed, until I was on it, by a clump of bushes.

While still silently watching the birds I saw something move a little to my right, and on turning round discovered a huge alligator, whom I had almost cut off from the lake. The bushes had hidden us until absolutely face to face, and he came by me with his teeth grinning and tail half cocked,

in the most unamiable frame of mind I ever saw in one of his tribe. Without intending it, I had very nearly cut him off from his native element; and though naturally a cowardly brute, feeling himself to a certain degree cornered, he had evidently made up his mind to fight. Not being prepared, with only small shot in my gun, for a duel with the reptile, I stopped short and gave him right of way, and, as he cleared me at about two yards, let him have both barrels behind the shoulder to expedite his movements, and had the satisfaction of seeing him give a jump into the water that would have done credit to a performer for the Grand National.

They are cowardly brutes, and though I have been frequently in parts of the world they inhabit, I have never yet heard of an instance of a man being attacked by one on land. In the water it is different. A boy had, while bathing, been taken down some months since close to this very spot, and from what I saw of the lagoon next morning, I would not have ventured a swim there for untold gold. Had I been a little quicker, and unintentionally barred this fellow's way to the lake, I am quite certain he would have attacked me, as he must have passed somehow. These creatures never take to the jungle, and, like a rat driven into a corner, he would have been obliged to fight.

On returning to the village we found our dinner nearly ready; bread and liquor we had brought with us, but the hunted fowl, new-laid eggs, and hot tortillas formed no bad meal for travellers sharp set by a mountain ride. After feeding, we visited some of the principal houses in the village, chaffed some of the good-humored and pretty little Indian girls, and arranged about a canoe for the following morning. We then slung our grass hammocks among the miscellaneous company and wooed the drowsy god of

slumber, our guide slinging his hammock up between us, and sleeping with his machete buckled around him, ready for attack or defence at a moment's notice.

The machete is the invariable companion of the poorer and middle classes of Mexicans, and the multiplicity of uses to which it is dedicated are something wonderful to the uninitiated. With it he clears the tangled paths in the forest; it helps to build his hut, to cut his firewood, and eat his dinner; he uses it for purposes of warfare, and too frequently also for purposes of assassination. The blade is broad, slightly curved, a little shorter than an infantry officer's regulation sword, and about twice as heavy. The handle is generally made of wood, the scabbard leather, and the edge invariably as keen as a razor. Occasionally the blades are ornamented with gold or silver, but the ordinary machete is perfectly plain.

Next morning we were up before daylight, and hastened to the banks of the lagoon, where according to agreement we should have found our canoe. None was forthcoming, however, and not until the sun broke fiercely on our heads and our patience was completely exhausted did our guide prevail on the man who was to have provided it to go in search of another. After a still further considerable delay, at last he arrived, but with a rickety conveyance that would only hold one gun besides the paddler; and H—— taking the canoe, I walked along the edge, and our shooting commenced.

The place was full of all kinds of odd-looking waterfowl. Geese, duck, teal, pelicans, flamingo, and spoonbills were in hundreds, and many kinds of waders unknown to me; in fact, such an extraordinary variety of fresh-water birds I had never seen together before. The ducks were particularly handsome, having bright bronze breasts, which shone like burnished metal in the sun. Of teal I shot

several varieties, many of them with exceedingly beautiful and brilliant plumage; but I think among the queer ones I killed there were none more beautiful in plumage than the spoonbill; for though his singular and uncouth beak did not improve his countenance, he had the most lovely and delicate tinge of rose-color through his white feathers it is possible to conceive. We had him for dinner two days afterwards, and found him excellent.

Not knowing a quarter of the birds that got up, and many being fishy and unfit for food, whenever one rose the guide would cry either "Buéno" or "No buéno," as it happened to be fit or unfit for culinary purposes; and so on for nine miles along the banks, sometimes through mud, at others through sand, and at others through jungle or water, did I plod along, taking whatever was termed "buéno," and occasionally peppering an obtrusive alligator when he came anything inside twelve yards.

The heat was intense, and, to add to the discomfort of walking, the paths through the jungle and mangrove swamps occasionally bordered the edges of the lake, and were so thickly crossed by cobwebs that they were perpetually knocking off my hat, getting in my mouth and eyes, and at times almost impeded my progress. I never saw anything like them. Occasionally large forest-trees were entirely covered from top to bottom, and so thickly shrouded that not a leaf or twig could be seen through its unnatural-looking winding-sheet. The lagoon seemed full of fish, which were jumping in shoals all over it; but not once during the day did we see a single bird settle on its surface; and from the number of alligators swimming about, I think they showed their wisdom.

It was capital sport, but precious hard work also, and I was just about "played out," when we reached a "ranche," where, after a pull of cold water that must have somewhat

alarmed my constitution, I tumbled into a grass hammock, uncommonly glad to get out of the burning sun.

A pleasant-featured young Mexican woman, with a dark-eyed, good-looking sister, soon despatched between them one of the many chickens running about the house; and while the *cazuela* was preparing they very good-naturedly washed out my shirt, lending me, *ad interim*, some embroidered garment of their own. The rest of my clothes were hung up to dry, every stitch on me being thoroughly saturated. H—— and the canoe soon after arrived, and how we did enjoy the homely but excellent fare our hostess put before us! Then came pipes and a siesta, and a couple of hours' rest saw us fit to return. H—— had got enough of it, and, borrowing a horse, rode back to the village. I returned in the canoe, and got a good many shots *en route*. Our bag was a mixed one, and consisted of the birds I have already mentioned, with several others whose names we did not know, and four rabbits. Wild duck and teal predominated, and the guides could hardly stagger from the canoe to the houses with our united bag.

The sun was fast setting as we left Pira la Questa on our return journey, and ere we reached the mountain-top it was quite dark. Unable to see a yard before us, but knowing we must go on, I threw the reins on my mule's neck, and, lighting a pipe, resigned myself implicitly to his sagacity, not only to find the path, but to avoid the obstacles which at every step lay before him. My confidence was not misplaced. With nose almost touching the ground, he seemed to smell his way along, and not once during our long ride did he deviate for a second from the proper track, or make a single false step or stumble. The sounds and strange cries during the dark stillness of the night were very remarkable. Whether caused by bird or insect I could not tell; but one in particular, resembling the pro-

longed whistle of a locomotive steam-engine, was frequently of more than a minute's duration without ceasing, and of such volume and intensity that unless I had been aware of the utter impossibility of a train being within hundreds of miles, I would have almost sworn to so familiar a sound. The lights of Acupulco at last came in sight, and our animals soon after deposited us safely, after a somewhat trying but very agreeable trip. . . .

On the 10th of May we left Acupulco and steamed quietly along the Mexican coast in sight of land until we reached Manzanillo Bay, on the southeast part of which are situated the few wretched huts that constitute the village. The harbor is well protected from southerly winds, but not from those directly from the westward. Behind the village, and only a few hundred yards from the sea-beach, is a large shallow lagoon which runs nearly forty miles into the interior, and at the end of the dry season becomes almost empty. The exhalations at this time rising from the mud and stagnant water are most dreadful, and even at our anchorage the stench during the night was almost unbearable. . . .

Next morning, before daylight, we started with Mr. D—— across the lagoon to a place about an hour's row from the village, where he said he was in the habit of getting wild duck. The lake was so shallow that our boat often grounded, and the oars at each stroke disturbed the black, ink-like mud that constituted the bottom. The sides were beautifully wooded, and surrounded by ranges of hills extending far into the interior, the edges of the water being fringed with a belt of mangrove-trees, whose peculiarly bright green foliage contrasted pleasingly with the sombre coloring of the leafless trees behind them. The perfectly stagnant water was of a light-yellow tint, and as full of alligators as it could well be. . . .

After firing a good many shots, and gathering a somewhat miscellaneous bag, Mr. D—— saw a large alligator asleep on some mud, lying half in and half out of the water; and as I was the only one of the party who had brought any bullets, he sent one of the guides to show me where it lay, in hope that I might get a shot.

Slowly, and with the greatest caution, I waded through water until I got within twelve yards of where the brute lay, and aiming about an inch behind the eye, drove a bullet clean into his brain. He gave a convulsive kind of shudder and lash with his tail, and was, I believe, dead; but to make certain I gave him the second barrel at about four yards' distance behind the shoulder, and then felt quite confident that I had indeed "wound him up."

It was some time before we could induce the natives to assist in pulling him on dry land. Though they do not mind them living and swimming about, they are particularly careful of a wounded one, a single sweep of its powerful tail, even when mortally stricken, being known to break both legs of a man like a pipe-stem. Though dead enough to all intents and purposes, an alligator, like either a shark or a turtle, will continue possessed of a certain amount of vitality and motion for a long period after life is really extinct. This fellow was still gently swaying his tail about while we bent on a rope to it, and, all five of us clapping on, soon hauled him to the dry mud on the bank, where we took his length, opened his jaws, and generally examined the formidable-looking reptile at our leisure. He was about fifteen feet long and inconceivably hideous. The first bullet had smashed a large hole exactly where I aimed, —namely, about one inch behind the eye; the skull seemed comparatively thin there, was unprotected by any thick skin, and a large lump of his brain was oozing through the wound. The second bullet went through his heart; but I

am convinced that it was unnecessary, as the first shot had done all that was needful.

Much as people have written to the contrary, I am quite satisfied now that an alligator is as easily slain as a rabbit, if only hit in the right place; and that place is not in the eye, as is generally stated, but on the same level, and from an inch to an inch and a half behind it. The brain in all reptiles lies rather far back in the head, joining almost to the neck. By striking one in the eye from many positions it is quite possible that the brain may not be touched at all; while, if the ball hits the slightest degree in front of it, on the creature's long ugly snout, the bullet might as well be chucked in the river for all the harm it will do the alligator. Unsightly as these gentry are, the Indians occasionally eat them. The skins are sometimes tanned; but they smell so strong, it is an awkward job to handle them. During dry seasons they collect in vast quantities in the small pools still left unevaporated, and are then killed in large numbers for their hides, which when tanned are found serviceable for many purposes. They are tougher than ordinary leather, and resist water better. Only the belly pieces are used.

Some few years ago during a very heavy rain, a number of alligators got taken out of the lake by a small river running into the sea, which was greatly flooded. They were immediately attacked by the sharks, and a strange battle ensued between these equally voracious monsters, which all the people of the village flocked out to witness. The battle lasted all day, and the noise of the combat could be heard half a mile off. John Shark was, however, more at home in his native element than his scaly antagonist, and eventually the alligators were all eaten up or killed.

THE SCENERY OF THE MEXICAN LOWLANDS.

FELIX L. OSWALD.

[Mexico is made up of two distinctively different regions; one, the central plateau, temperate in climate, and marked by a great dearth of rainfall; the other, the lowland areas between the plateau and the bordering oceans, tropical in climate and productions, and luxuriant from abundant rains. Dr. Oswald, in the following selection, leads us through the Valley of Oaxaca, a section of this Tierra Caliente, or warm country, and makes us familiar with its interesting vegetable and animal productions and its scenic features.]

We had a glimpse of the sun before we finished our short breakfast, and when we plunged into the maze of the forest the occasional vistas through the leafy vault revealed larger and larger patches of bright blue sky. Our so-called road, however, was worse than anything I had ever seen or heard of Flemish or South Louisiana synonymes of that word,—miry lagoons and spongy mud as black and as sticky as pitch. I followed at the heels of my carrier, who preferred the lagoons and seemed to find the shallow places by a sort of instinct, and the Switzer managed to propel his heavy boots through the toughest quagmire; but his boy, after losing his shoes five or six times, slung them across his shoulder and splashed on barefoot. We kept through a comparatively open forest of cottonwood- and tulip-trees, with a dense jungle on our right-hand side, while on our left the land sloped towards the bottom of the Rio Verde, which is here about five hundred paces wide, and during the rainy season fills its muddy banks to the brink. These lower coast forests abound in gigantic trees, whose fruits are only accessible to the winged and four-handed denizens of the forest, but farther up the river-

shores are lined for miles with a dense growth of wild-growing plantains, of which the natives distinguish four varieties under as many different names. The fruit of the largest, the *cuernavacas* ("cow-horns"), attains a weight of seven pounds, and resembles in shape the crooked pod of the tamarind rather than the cucumber-shaped little bananas which reach our Northern markets. They ripen very slowly, and often rot on the tree before they become eatable, but the Mexicans cure them over a slow fire of embers and green brushwood, after which their taste can hardly be distinguished from that of the finest yellow bananas. Palm-trees mingle here with the massive stems of the cottonwoods, talipot-palms, and the *Palma prieta*, whose nut might become a profitable article of export, having a close resemblance to a filbert. The plum-clusters of the mango can only be reached by a bold climber, as the trunk rises like a mast, often perfectly free from branches for eighty or ninety feet, and the chief beneficiaries of this region are still the macaws and squirrel-monkeys; but farther up Pomona becomes more condescending, and the ancient Gymnosophists, whose religion restricted true believers to a diet of wild-growing tree-fruits, would have found their fittest home in the terrace-land between the lower twenty miles of the Rio Verde and the foot-hills of the Sierra de San Miguel.

Plum-bearing bushes abound from June to September with red, yellow, and wax-colored fruit; the *morus*, or wild mulberry-tree, literally covers the ground with its dark, honey-sweet berries; the crown of the pino-palm is loaded with grape-like clusters, which, struck by a cudgel, discharge a shower of rich acorn-shaped nuts; guavas, alligator-pears, mamayos, chirimoyas, and wild oranges display flowers and fruit at the same time, and under the alternate influence of heat and moisture produce their

perennial crops with unfailing regularity; the algarobe (*Mimosa siliqua*), a species of mezquite not larger than an apple-tree, yields half a ton of the edible pods known as carob-beans or St. John's bread; the figs of the gigantic banyan-tree furnish an aromatic syrup; the trunks of the *Robinia viridis* exude an edible gum; and from the vine-tangle forming the vault of the forest hang the bunches and clusters of forty or fifty varieties of wild grapes, many of them superior to our scuppernongs and catawbas, while the amber-colored *Uva real* rivals the flavor of the finest Damascene raisin-grapes. A forced march of ten hours through fens and silent virgin woods brought us at last to the hummock region; the plain swelled into mounds, and the currents of the sluggish bayous became more perceptible. The higher levels showed vestiges of cultivation; we crossed dykes and ditches, a neglected fence here and there, and where the larger trees had been felled grapes and liana figs covered even the bushes and hedges in incredible profusion. A troop of capuchin monkeys leaped from a low mango-tree, and two stumbling youngsters who brought up the rear in the scramble for the high timber would have tempted us to a chase if we had not been anxious to reach less malarious quarters before night. The neighborhood of the great swamps still betrayed itself by that peculiar miasmatic odor which emanates from stagnant pools and decaying vegetable matter, and in the recesses of the forest fluttered the slate-colored swamp-moth, the ominous harbinger of the mosquito. The tipulary pests were getting ready for action; their skirmishers, the *sancudos* and *moscas negras*, had already opened the campaign, and became sensible as well as audible in spite of the rapidity of our march. One of the twilight species, the *Mosca delgada*, a straw-colored little midge, bites like a fire-ant,—a mischievous and, it seems, unpractical freak

of nature, since the superfluous virulence of its sting must certainly interfere with the business facilities of a suctorial insect.

[As evening descended the travellers reached a cotton plantation, and hastened to take refuge from the rising cloud of mosquitoes.]

The cotton-gin loomed at the farther end of the field, and was taken by storm over piles of muck and scattered fence-rails. Seeing no ladder, we clambered through the pivot-hole in the ceiling of a musty-smelling machine-shed, but in the open loft above we found a delicious breeze, and —St. Hubert be praised!—not a single mosquito.

The carrier threw himself upon his pack with a sigh of relief, and we squatted around the hatch to cool off before we opened our mess-bag.

From the hills on our right came the perfume of blooming tamarisks, and from the jungle below a cool lake-air; and at times strange voices of the wilderness,—the hoarse bark of a cayman, answered by the shriek of swamp-geese in the canebrakes of the Rio Verde, and in the distance now and then a queer rustling sound, like the shaking of a tree butted by some heavy animal. Bats were circling above our heads in the moonlight, and our advent seemed to have excited the curiosity of a troop of flying-squirrels, who uttered their chirping squeak now on the roof, now in the branches of a neighboring live-oak-tree.

After removing a layer of seed-cotton that might harbor scorpions or centipedes, I spread my blanket near the hatch and made myself comfortable for the night. My feet still smarted, though I had pulled off my stockings as well as my boots; yet I could not regret the hardships of a march which had brought us to such an encampment. The portador was taking his ease in the centre of the floor, where the night-wind played with his long hair, while the

Swiss boy had fallen asleep on the mantle of his countryman, who was sitting in the open louvre, smoking his pipe in measureless content. The air up here was delightfully cool, and, with the buzz of the legions of Beelzebub still ringing in our ears, the sense of security itself was more than a negative comfort.

Baron Savarin, who wrote a treatise on the art of enjoying life, should have added a chapter on the happiness of contrast. A snug little cottage in a stormy November night, a shade-tree on the Llano Estacado, the silence of the Upper Alleghanies after a "revival-meeting" in the valleys, a bath in the dog-days, would rank above all the luxuries of Paris and Stamboul, if unbought enjoyments could ever become fashionable.

The moon set soon after midnight, but we managed to readjust our luggage by the light of greased paper spills, and entered the gates of the foot-hills before the watch-call of the night-hawk had been silenced by the reveille of the iris-crows. A keen land-breeze, tumbling the mists through the fens of the Tierra Caliente, gave promise of a bright day. What wonderful perfumes the morning wind brews from the atmosphere of a moist tropical forest-land!—scents that haunt the memory more persistently than the echo of a weird song. No latter-day nose could analyze these odors and trace them to their several sources; but with or without an attempt at further classification, they might be primarily divided into sweet and pungent aromatic smells, the latter prevailing in the coast jungles, the former in the mountain forests. A few of the first named—the spicy scents—are so peculiar that, once identified, they can be easily recognized: here, for instance, the effluvium of the musk lianas, whose flowers diffuse a sort of odorous diapason which predominates, even through the bouquet-medley of the South Mexican flora.

As the white streaks in the east assumed a yellowish tint, the paroquets in the crests of the pino-palms saluted the morning with sudden screams; the multitudinous voices of a crow-swarm approached from the coast forests; two and two, and in a series of pairs, the macaws came flying across the sky; and in our near neighborhood the startling cry of the *chachalaca* or jungle-pheasant went up from an hibiscus thicket. Softly first, then louder and louder, the *calanda*, the mocking-bird of the tropics, intonated its morning hymn, and the fluting curlew rose from the grass like a skylark; but a sweeter sound to our ears was the murmuring of a little brook at the roadside. We had reached the region of rocks and swift-flowing waters.

Of reptiles, as of Red Republicans, it may be said that they are least dreaded in the countries where they most abound. While a New England boarding-school virgin goes into epileptic spasms at the aspect of a blindworm, the young Mexicanas surround themselves with a variety of ophidian pets, and view a freckled tree-snake and a gay butterfly with equal pleasure or equal unconcern. A little barefoot girl that met us on her way to the spring put her toes caressingly on the smooth hide of a green-and-white speckled *Vivora mansa* that wriggled across the road; and our barelegged portador kicked dozens of good-sized bush-snakes out of our path after noticing that they frightened our young travelling companion. More than ninety per cent. of all South American snakes are as harmless as lizards, and the four or five venomous varieties are well known and easily avoided.

I will here add a word on the dreaded venomous insects of the tropics. The ant and mosquito plagues of the coast jungles can hardly be over-estimated, but the virulence of their larger congeners is frequently and grossly exaggerated. The chief insect-ogres of sensation romancers and

fireside travellers are three: the scorpion, the tarantula, and the centipede, either of whom can rival the homicidal prestige of Victor Hugo's octopus. But I may confidently appeal to the verdict of any personal observer who has passed a few years in the African or American tropics when I assert that these supposed express-messengers of Death are not more venomous and are far less aggressive than our common North American hornet. I doubt if the sting of twenty tarantulas could cause the death of a healthy child, and I am quite sure that a poison-ivy blister and the bite of a fire-ant are more painful than the sting of a centipede. An hysterical lady may succumb to the bite of a common gadfly, but I hold that only co-operative insects—termites, wasps, humble-bees, etc.—could ever make away with a normally constituted human being.

A swarm of vociferous iris-crows appeared in the sky overhead, and before they had passed, the woods were wide awake all around. The humming-birds were on the wing, the wood-pigeons repeated their murmuring call in the taxus-groves, and from the lower depths of the forest came the chattering scream of a squirrel-monkey. The rising sun was hidden by the tree-tops of the eastern valleys when we halted on the summit of a rocky bluff, but the mountain mists had disappeared, and the vistas on our left afforded a dazzling view of the sunlit foot-hills and the valley of the Rio Verde. The river is here crossed by a rope-ferry a little above its junction with a tributary that drains the glorious valley of Morillo and an Alpine group whose wooded heights stand in my memory like a vision of a Ganadesha, the mountain park of Indra's Paradise.

The air of these woodlands is the antithesis of our Northern workshop atmosphere. There is a feeling of delight—our lost sixth sense, I am tempted to call it—which gratifies the lungs rather than the olfactory organ

if you inhale the morning breezes, oxidated, and perhaps ozonized, by the first influence of sunlight on the aromatic vegetation of these hills,—a delight which, like the charm of harmonious sounds, reacts on the soul, and awakens emotions which have lain dormant in the human breast since we exchanged the air of our Summer-land home for the dust of our hyperborean tenement-prisons.

The hum of insects soon mingled with the bird-voices of our forest. To and fro, in fitful flight, flashed the *libellas*, the glitter-winged dragon-flies, and a few large papilios flopped lazily through the dew-drenched foliage. No gnats up here, but thousands of tiny, honey-seeking wasps and midges, and bright-winged grasshoppers that rose with a fluttering spring when the first sunbeams reached the damp underbrush. Ants hurried about their daily toil, and when we ascended the next ridge we saw various kinds of lizards flitting across the road or basking on the wayside rocks, one of them a sort of dwarf iguana of a moss-green tint, on which protective color it seemed to rely for its safety, as its movements were as sluggish as those of a toad.

As we kept steadily up-hill, the sun seemed to mount very rapidly, and, peak after peak, the summits of the upper Sierra rose into view. Zempantepec, La Sirena, and the Nevada de Colcoyan towered above the rest, the latter at least four thousand feet above the snow-line. Few prospects on earth could efface the impression of that panorama. In the Sierra de San Miguel our continent reproduces the Syrian Lebanon on a grander scale. Septimius Severus, who vacillated between his throne and the Elysian valleys of Daphne, would have renounced the empire of the world for the mountain-gardens of the Val de Morillo, and the giants of the cypress forests on the southeastern slope of the Sierra dwarf all the cedars of Bashan and Hebron.

The largest, though not the tallest, of these trees, the cypress of Maria del Tule (twelve miles south of San Miguel), which Humboldt calls the "oldest vegetable monument of our globe," has a diameter of forty-two feet, a circumference of one hundred and thirty-six feet near the ground and of one hundred and four feet higher up, and measures two hundred and eighty-two feet between the extremities of two opposite branches. Yet this tree has many rivals in the Val de Morillo and near the sources of the Rio Verde, where groups of grayish-green mountain-firs rise like hillocks above the surrounding vegetation.

On our right extended the orange-gardens of Casa Blanca for two miles along the base of the hill to a deep ravine, reappearing on the other side, where their white-blooming tree-tops mingled with the copses of a banana-plantation. Farther up, euphorbias and hibiscus prevailed, and the upper limit of the foot-hills is marked by the paler green of the cork-oak forests that cover the slopes of the sierra proper. In the northeast this sierra becomes linked with the ramifications of the central Cordilleras, and connected with our ridge by one of the densely-wooded spurs that flank the plateau of the Llanos Ventosos. The rocks at our feet belonged, therefore, to a mountain-chain that might be called a lineal continuation of the Gila range in Arizona and Nueva Leon. But what a difference in the climate and scenery! There arid rocks and thorny ravines; here dense mountain forests, deep rivers, a saturated atmosphere, and springs on almost every acre of ground. The very brambles in the rock-clefts were fresh with dew, and the sprouts of the broom-furze looked like wildering asparagus. The ravines flamed with flowers of every size and every hue. An agent of a London or Hamburg curiosity-dealer might make his living here with a common butterfly-net. On any sunny forenoon an active boy could

REGINA ANGELORUM (QUEEN OF THE ANGELS)

FROM THE WORLD-FAMOUS PAINTING BY BOUGUEREAU, PARIS EXPOSITION, 1900

gather a stock of Lepidoptera that would create a bonanza sensation among the collectors of a North European capital. The rhododendron thickets of the upper Rio Verde are frequented by gigantic varieties of nymphalis, vanessa, and parnassius, which would retail in Brussels at from two to ten dollars apiece.

The sun rose higher, but not the thermometer, and when we clambered up through an orchard of scattered cherry-trees I am sure that the maximum temperature in the shade did not exceed sixty-five degrees Fahrenheit. We had reached the Llanos Ventosos, the air-plains of San Miguel, the playground of the four winds of heaven, where sun-strokes are unknown, though the mists of the rainy season never cloud their deep-blue sky. Down in the coast jungles the Rain-fiend was at it again: dark-gray showers swept visibly along the shore, while the foot-hills simmered under the rays of a vertical sun. But up here the air was dry as well as cool; the edge of the plateau is at least six thousand feet above the level of the Pacific, which is in plain view from Punta Piedra to the downs of Tehuantepec.

We entered the village about two P.M., and my companions conducted me to a little frame house, where I was hospitably received by the Indian gardener and the daughters of Pastor Wenck, the minister of the Protestant part of the community, whose brother in Tehuantepec had intrusted me with different letters, with a note of introduction. The pastor had harnessed his mule an hour ago to get a load of Spanish moss from the foot-hills, so I left my carrier in charge of the Indian gardener and sauntered out into the village.

Neubern (New Bern) de San Miguel—or Villa Cresciente, as it was originally called, from its situation on a crescent-shaped bluff—was founded in 1865 under the

happiest auspices, the charter of the colony including such inducements as exemption from taxes for the first five years, free roads and schools, gratuitous seed-corn, farming implements, etc., to indigent immigrants, and attracted a considerable number of the very best agriculturists from Tyrol and Southern Switzerland. But after the collapse of the imperial government a waning moon would have been the fitter emblem of the Crescent Village: its privileges were abrogated, and many of the disappointed Bauern returned to their native countries. Still, the appointment of a few half-Indian officials is the only positive grievance of the colonists, and the advantages of their climate and situation might well reconcile them to greater inconveniences.

At a distance of only sixteen degrees from the equator, the average temperatures of the coldest and warmest months differ less than spring and summer in the United States, so that the September weather of Geneva or Innspruck is here as perennial as a sea-fog in Newfoundland. During a residence of seven years, Pastor Wenck has chronicled four thunder-storms, twenty-two common storms, two hoar-frosts (both in November), one sultry day, and two hundred and eight short showers, leaving a balance of two thousand two hundred and ninety-two days of *himmelswetter*,—heaven weather,—as he called it, alternating with cool nights whose dew indemnifies the fields for the scantiness of the annual rainfall. Yet the denizens of this Himmel-land come in for a first-hand share of all the luxuries which a compensating nature has lavished on the inhabitants of the sweltering Tierra Caliente.

Forty or fifty varieties of tropical fruits come to their tables in a freshness and sun-ripened sweetness quite unknown to our Northern markets; their builders may select their material from groves of mahogany, iron-wood,

American ebony, green-heart, euphorbia, and other timber-trees of the coast swamps; cacao, vanilla, gums, and frankincense can be bought at half trade prices, and an excursion of ten miles will take them to a region where the pot-hunter can fill his bag day after day without fear of ever exhausting the meat-supply, where the adventurous sportsman may try his luck and the mettle of his dogs, and where the naturalist can revel in all the wonders of a tropical terra incognita.

AMONG THE RUINS OF YUCATAN.

JOHN L. STEPHENS.

[The Egypt of America, as one may fairly call the Maya region of Yucatan, was first brought prominently into notice by John L. Stephens, who did yeoman service in exploring the massive monuments of a past civilization there scattered, and in describing and picturing their remarkable details. Since his period many travellers have visited and studied these vast remains and described them in abundant detail. But Stephens visited that region as a discoverer, and from his works we select a description of the difficulties under which he labored in his interesting work of exploration at Copan. He had taken quarters in a hut near the ruins, and returned to his former quarters for his luggage. The homeward journey was accomplished under stress of opposing circumstances.]

In the mean time it began to rain; and, settling my accounts with the señora, thanking her for her kindness, leaving an order to have some bread baked for the next day, and taking with me an umbrella and a blue bag, contents unknown, belonging to Mr. Catherwood, which he had particularly requested me to bring, I set out on my return. Augustin followed, with a tin teapot and some other articles for immediate use. Entering the woods, the

umbrella struck against the branches of the trees and frightened the mule; and, while I was endeavoring to close it, she fairly ran away with me. Having only a halter, I could not hold her, and, knocking me against the branches, she ran through the woods, splashed into the river, missing the fording-place, and never stopped till she was breast-deep. The river was swollen and angry, and the rain pouring down. Rapids were forming a short distance below. In the effort to restrain her I lost Mr. Catherwood's blue bag, caught at it with the handle of the umbrella, and would have saved it if the beast had stood still; but as it floated under her nose she snorted and started back. I broke the umbrella in driving her across, and, just as I touched the shore, saw the bag floating towards the rapids, and Augustin, with his clothes in one hand and the teapot in the other, both above his head, steering down the river after it. Supposing it to contain some indispensable drawing-materials, I dashed among the thickets on the bank, in the hope of intercepting it, but became entangled among branches and vines.

I dismounted and tied my mule, and was two or three minutes working my way to the river, where I saw Augustin's clothes and the teapot, but nothing of him, and, with the rapids roaring below, had horrible apprehensions. It was impossible to continue along the bank; so, with a violent effort, I jumped across a rapid channel to a ragged island of sand covered with scrub-bushes, and, running down to the end of it, saw the whole face of the river and the rapids, but nothing of Augustin. I shouted with all my strength, and, to my inexpressible relief, heard an answer, but, in the noise of the rapids, very faint; presently he appeared in the water, working himself round a point and hauling upon the bushes. Relieved about him, I now found myself in a quandary. The jump back was to

higher ground, the stream a torrent, and, the excitement over, I was afraid to attempt it. It would have been exceedingly inconvenient for me if Augustin had been drowned. Making his way through the bushes and down to the bank opposite with his dripping body, he stretched a pole across the stream, by springing upon which I touched the edge of the opposite bank, slipped, but hauled myself up by the bushes with the aid of a lift from Augustin.

All this time it was raining very hard, and now I had forgotten where I tied my mule. We were several minutes looking for her, and, wishing everything but good luck to the old bag, I mounted. Augustin, principally because he could carry them more conveniently on his back, put on his clothes.

[Reaching a village, he took shelter till the rain abated, but it began worse than ever after he again took to the road.]

I rode on some distance, and again lost my way. It was necessary to enter the woods on the right. I had come out by a foot-path which I had not noticed particularly. There were cattle-paths in every direction, and within the line of a mile I kept going in and out, without hitting the right one. Several times I saw the print of Augustin's feet, but soon lost them in puddles of water, and they only confused me more; at length I came to a complete stand-still. It was nearly dark; I did not know which way to turn; and as Mr. Henry Pelham did when in danger of drowning in one of the gutters of Paris, I stood still and halloed. To my great joy, I was answered by a roar from Augustin, who had been lost longer than I, and was even in greater tribulation. He had the teapot in his hand, the stump of an unlighted cigar in his mouth, was plastered with mud from his head to his heels, and altogether a most distressful object.

We compared notes, and, selecting a path, shouting as we went, our united voices were answered by barking dogs and Mr. Catherwood, who, alarmed at our absence, and apprehending what had happened, was coming out with Don Miguel to look for us. I had no change of clothes, and therefore stripped and rolled myself in a blanket, in the style of a North American Indian. All the evening peals of thunder crashed over our heads, lightning illuminated the dark forest and flashed through the open hut, the rain fell in torrents, and Don Miguel said that there was a prospect of being cut off for several days from all communication with the opposite side of the river and from our luggage. Nevertheless, we passed the evening with great satisfaction, smoking cigars of Copan tobacco, the most famed in Central America, of Don Miguel's own growing and his wife's own making. . . .

At daylight the clouds still hung over the forest; as the sun rose they cleared away; our workmen made their appearance, and at nine o'clock we left the hut. The branches of the trees were dripping wet, and the ground was very muddy. Trudging once more over the district which contained the principal monuments, we were startled by the immensity of the work before us, and very soon concluded that to explore the whole extent would be impossible. Our guides knew only of this district; but having seen columns beyond the village, a league distant, we had reason to believe that others were strewed in different directions, completely buried in the woods and entirely unknown. The woods were so dense that it was almost hopeless to think of penetrating them. The only way to make a thorough exploration would be to cut down the whole forest and burn the trees. This was incompatible with our immediate purposes, might be considered taking liberties, and could only be done in the dry season.

After deliberation we resolved first to obtain drawings of the sculptured columns. Even in this there was great difficulty. The designs were very complicated, and so different from anything Mr. Catherwood had ever seen before as to be perfectly unintelligible. The cutting was in very high relief, and required a strong body of light to bring up the figures, and the foliage was so thick and the shade so deep that drawing was impossible.

After much consultation we selected one of the "idols," and determined to cut down the trees around it, and thus lay it open to the rays of the sun. Here again was difficulty. There was no axe, and the only instrument which the Indians possessed was the machete, or chopping-knife, which varies in form in different sections of the country. Wielded with one hand, it was useful in clearing away shrubs and branches, but almost harmless upon large trees; and the Indians, as in the days when the Spaniards discovered them, applied to work without ardor, carried it on with little activity, and, like children, were easily diverted from it. One hacked into a tree, and when tired, which happened very soon, sat down to rest, and another relieved him. While one worked there were always several looking on. I remembered the ring of the woodman's axe in the forest at home, and wished for a few long-sided Green Mountain boys.

But we had been buffeted into patience, and watched the Indians while they hacked with their machetes, and even wondered that they succeeded so well. At length the trees were felled and dragged aside, a space cleared around the base, Mr. C.'s frame set up, and he set to work. I took two Mestitzoes, Bruno and Francisco, and, offering them a reward for every new discovery, with a compass in my hand set out on a tour of exploration. Neither had seen "the idols" until the morning of our first visit, when they

followed in our train to laugh at los Ingleses; but very soon they exhibited such an interest that I hired them. Bruno attracted my attention by his admiration, as I supposed, of my person; but I found it was of my coat, which was a long shooting-frock, with many pockets, and he said that he could make one just like it except the skirts. He was a tailor by profession, and in the intervals of a great job upon a roundabout jacket worked with his machete. But he had an inborn taste for the arts. As we passed through the woods nothing escaped his eye, and he was professionally curious touching the costumes of the sculptured figures. I was struck with the first development of their antiquarian taste. Francisco found the feet and legs of a statue, and Bruno a part of the body to match, and the effect was electric upon both. They searched and raked up the ground with their machetes till they found the shoulders, and set it up entire except the head; and they were both eager for the possession of instruments with which to dig and find this remaining fragment.

It is impossible to describe the interest with which I explored these ruins. The ground was entirely new; there were no guide-books or guides; the whole was a virgin soil. We could not see ten yards before us, and never knew what we should stumble upon next. At one time we stopped to cut away branches and vines which concealed the face of a monument, and then to dig round and bring to light a fragment, a sculptured corner of which protruded from the earth. I leaned over with breathless anxiety while the Indians worked, and an eye, an ear, a foot, or a hand was disentombed; and when the machete rang against the chiselled stone, I pushed the Indians away and cleared out the loose earth with my hands. The beauty of the sculpture, the solemn stillness of the woods, disturbed only by the scrambling of monkeys and the chat-

tering of parrots, the desolation of the city, and the mystery that hung over it, all created an interest higher, if possible, than I had ever felt among the ruins of the Old World. After several hours' absence I returned to Mr. Catherwood, and reported upward of fifty objects to be copied.

I found him not so well pleased as I expected with my report. He was standing with his feet in the mud, and was drawing with his gloves on, to protect his hands from the mosquitoes. As we feared, the designs were so intricate and complicated, the subjects so entirely new and unintelligible, that he had great difficulty in drawing. He had made several attempts, both with the camera lucida and without, but failed to satisfy himself or even me, who was less severe in criticism. The "idol" seemed to defy his art; two monkeys on a tree on one side appeared to be laughing at him, and I felt discouraged and despondent. In fact, I made up my mind, with a pang of regret, that we must abandon the idea of carrying away any materials for antiquarian speculation, and must be content with having seen them ourselves. Of that satisfaction nothing could deprive us. We returned to the hut with our interest undiminished, but sadly out of heart as to the result of our labors.

[Meanwhile, the blue bag which had caused so much trouble was recovered, under the incitement of a dollar reward. It was found to contain a pair of old, but water-proof, boots, whose recovery cheered Mr. Catherwood's heart, enabling him the next day to defy the wet mud.]

That day Mr. Catherwood was much more successful in his drawings; indeed, at the beginning the light fell exactly as he wished, and he mastered the difficulty. His preparations, too, were much more comfortable, as he had his water-proofs, and stood on a piece of oiled canvas used for covering luggage on the road. I passed the morning in

selecting another monument, clearing away the trees, and preparing it for him to copy. At one o'clock Augustin came to call us to dinner. Don Miguel had a patch of beans, from which Augustin gathered as many as he pleased, and, with the fruits of a standing order for all the eggs in the village, being three or four a day, strings of beef, and bread and milk from the hacienda, we did very well. In the afternoon we were again called off by Augustin, with the message that the alcalde had come to pay us a visit. As it was growing late, we broke up for the day, and went back to the hut. We shook hands with the alcalde, and gave him and his attendants cigars, and were disposed to be sociable; but the dignitary was so tipsy he could hardly speak. His attendants sat crouching on the ground, swinging themselves on their knee-joints, and, though the positions were different, reminding us of the Arabs. In a few minutes the alcalde started up suddenly, made a staggering bow, and left us.

[Yet trouble was brewing for them. They had made an enemy of the great man of the district, and he stirred up the people to hostility. The annoyance grew so great that Stephens found it necessary to take some steps to restore amity.]

Mr. Catherwood went to the ruins to continue his drawings, and I to the village, taking Augustin with me to fire the Balize guns, and buy up eatables for a little more than they were worth. My first visit was to Don Jose Maria. After clearing up our character, I broached the subject of a purchase of the ruins; told him that, on account of my public business, I could not remain as long as I desired, but wished to return with spades, pickaxes, ladders, crowbars, and men, build a hut to live in, and make a thorough exploration; that I could not incur the expense at the risk of being refused permission to do so; and, in short, in

plain English, asked him, "What will you take for the ruins?" I think he was not more surprised than if I had asked him to buy his poor old wife, our rheumatic patient, to practise medicine upon. He seemed to doubt which of us was out of his senses. The property was so utterly worthless that my wanting to buy it seemed very suspicious. On examining the paper, I found that he did not own the fee, but held under a lease from Don Bernardo de Aguila, of which three years were unexpired. The tract consisted of about six thousand acres, for which he paid eighty dollars a year; he was at a loss what to do, but told me that he would reflect upon it, consult his wife, and give me an answer at the hut the next day.

I then visited the alcalde, but he was too tipsy to be susceptible of any impression; prescribed for several patients; and instead of going to Don Gregorio's sent him a polite request by Don Jose Maria to mind his own business and let us alone; returned and passed the rest of the day among the ruins. It rained during the night, but again cleared off in the morning, and we were on the ground early. My business was to go around with the workmen to clear away trees and bushes, dig, and excavate, and prepare monuments for Mr. Catherwood to copy. While so engaged, I was called off by a visit from Don Jose Maria, who was still undecided what to do; and not wishing to appear too anxious, told him to take more time, and come again the next morning.

The next morning he came, and his condition was truly pitiable. He was anxious to convert unproductive property into money, but afraid, and said that I was a stranger, and it might bring him into difficulty with the government. I again went into proof of character, and engaged to save him harmless with the government, or release him. Don Miguel read my letters of recommendation, and re-read the letter of General Cascara. He was convinced, but these

papers did not give him a right to sell his land; the shade of suspicion still lingered; for a finale, I opened my trunk, put on a diplomatic coat, with a profusion of large eagle buttons. I had on a Panama hat, soaked with rain and spotted with mud, a check shirt, white pantaloons, yellow up to the knees with mud, and was about as *outré* as the negro king who received a company of British officers on the coast of Africa in a cocked hat and military coat, without any inexpressibles; but Don Jose Maria could not withstand the buttons on my coat; the cloth was the finest he had ever seen; and Don Miguel, and his wife, and Bartale realized fully that they had in their hut an illustrious incognito. The only question was who should find paper on which to draw the contract. I did not stand upon trifles, and gave Don Miguel some paper, who took our mutual instructions, and appointed the next day for the execution of the deed.

The reader is perhaps curious to know how old cities sell in Central America. Like other articles of trade, they are regulated by the quantity in market and the demand; but, not being staple articles, like cotton and indigo, they were held at fancy prices, and at that time were dull of sale. I paid fifty dollars for Copan. There was never any difficulty about price. I offered that sum, for which Don Jose Maria thought me only a fool; if I had offered more, he would probably have considered me something worse.

We had regular communications with the hacienda by means of Francisco, who brought thence every morning a large waccal of milk, carrying it a distance of three miles and fording the river twice. The ladies of the hacienda had sent us word they intended paying us a visit, and this morning Don Gregorio's wife appeared, leading a procession of all the women of the house, servants, and children, with two of her sons. We received them among the ruins,

seated them as well as we could, and, as the first act of civility, gave them cigars all around. It can hardly be believed, but not one of them, not even Don Gregorio's sons, had ever seen the "idols" before, and now they were much more curious to see Mr. C.'s drawings. In fact, I believe it was the fame of these drawings that procured us the honor of the visit. In his heart, Mr. C. was not much happier to see them than the old Don was to see us, as his work was stopped, and every day was precious. As I considered myself in a manner the proprietor of the city, I was bound to do the honors; and, to the distress of Mr. C., brought them all back upon him.

Obliged to give up work, we invited them down to the hut to see our accommodations; some of them were our patients and reminded us we had not sent the medicines we promised. The fact is, we avoided giving medicines when we could, among other reasons, from an apprehension that if any one happened to die on our hands we should be held responsible; but our reputation was established; honors were buckled on our backs and we were obliged to wear them. These ladies, in spite of Don Gregorio's crustiness, had always treated us kindly, and we would fain have shown our sense of it in some other mode than by giving them physic; but to gratify them in their own way, we distributed among them powders and pills, with written directions for use; and when they went away escorted them some distance, and had the satisfaction of hearing that they avenged us on Don Gregorio by praises of our gallantry and attentions.

[As regards the wonderful discoveries which Mr. Stephens made in his low-priced city, the story is much too extensive to be given here, and those who would know more about these remarkable ruins must refer to his "Incidents of Travel in Central America, Chiapas, and Yucatan," which will be found abundantly worth perusal.]

THE ROUTE OF THE NICARAGUA CANAL.

JULIUS FROEBEL.

[The waters which it is proposed to utilize in the construction of the Nicaragua Canal, mainly those of the San Juan River and the Lake of Nicaragua, are of sufficient interest to call for some description at our hands, and we subjoin, from Froebel's "Seven Years of Travel in Central America," an account of a journey on those waters.]

At that time [1850] steamboats were not yet plying on the San Juan River and the Lake of Nicaragua, and I had to content myself with the accommodations of one of the large canoes of the natives called *bongos*, which were then the principal means of transport between the coast and the interior, for passengers as well as for merchandise. In company with two Americans, who, like myself, were anxious to proceed to Granada, I hired one of the largest of these clumsy little crafts, manned with ten boatmen or *marineros*, together with their captain or *patron*, all of them colored people from the interior. We laid in provisions for a fortnight, such being the full time of a passage which is now performed by steamers in two days.

We left San Juan on the 23d of November, and arrived at Granada on the 5th of the following month. In reference to the beauties of nature the trip is one of the most interesting that can be made, though the state of my health prevented my enjoying it. . . . An open shed, furnished with a hammock and surrounded by a plantain garden of half an acre, was the only improvement in an extent of more than a hundred miles. With this single exception, and with that of the site of the old castle of San Juan, more generally known by the popular name of

Castillo Viejo, the banks were covered with trees to the water's edge, their branches often bearing a vegetation of vines, climbers, and parasites, so densely interwoven that the whole appeared like a solid wall of leaves and flowers.

I shall never forget the impressions of one night and morning on this river. Our boat had anchored in the midst of the stream. Strange forms of trees, spectre-like in the dark, stood before us, and seemed to move as the eye strove in vain to make out their real shape. From time to time a splash in the water, caused by the movement of an alligator, the bellowing of a manatee, the screeching of a night-bird, or the roar of some beast of the forest, broke the silence, and mingled at last with my feverish dream.

In the morning a song our boatmen addressed to the Virgin roused me from my sleep. It was a strain of plaintive notes in a few simple but most expressive modulations. Several years later I heard them again, sung by the Mexican miners in the subterraneous chapel of the quicksilver mine of New Almaden in California, and I never shall forget the deep emotion felt on both occasions, so widely different in every other respect. In the latter the scene passed in a narrow excavation before a little altar cut out of the natural rock, on which, before a gilded image of the Virgin, two thin tallow candles were casting their scanty light over the forms of fifteen or twenty men calling down the blessing of Heaven on their day of work in the interior of the mountain. In the former, it was in the brightness and splendor of a morning of which no description can convey a full idea to one who has had no experience in the most favored regions of a tropical climate. The sun was just rising, and as the first rays, gilding the glassy leaves of the forest, fell upon the bronze-colored bodies of our men, letting the naked forms of their athletic frames appear in all the contrast of light and shade, while

accents plaintive and imploring strained forth from their lips, I thought to hear the sacred spell by which, unconscious of its power, these men were subduing their own half-savage natures.

At once the same song was repeated from behind a projecting corner of the bank, and other voices joined those of our crew in the sacred notes. Two canoes, covered from our view, had anchored near us during the night. The song at last died away in the wilderness. A silent prayer—our anchor was raised, and, with a wild shout of the crew, twelve oars simultaneously struck the water. The sun was glittering in the river. The tops of the trees were steeped in light, monkeys were swinging in the branches, splendid macaws flew in pairs from bank to bank; all around exhibited the glory and brightness of superabundant nature.

Near the mouth of the river, as far up as the higher end of its delta, the banks are almost on the water's level, overgrown with reeds, mangroves, and a low species of palm-tree, the latter forming extensive thickets in the swamps. After a distance of fourteen or fifteen miles the land gradually becomes a little higher, and steep embankments of a brown or reddish clay rise to some ten or twenty feet above the water. The low palm thickets of the swampy region disappear, and a vegetation of splendid trees, mostly exogenous, overhung with blooming vines, takes their place. Flowery garlands, swung from branch to branch, hang over the stream, while now and then the slender shaft of one of the tallest species of the palm tribe wafts its little crown of feathery leaves high over the gorgeous masses of the heavier foliage.

Eight or ten miles higher up the region of the *randales*, or rapids, begins. Here the river, locked in between wooded hills, presents a new character of scenery. The

trees, covering the hill-sides with an almost impenetrable forest, exhibit an extraordinary variety of forms in striking contrast. The most interesting situation in this region is that of the *Castillo Vièjo.* Here, where the river foams over a bed of rocks, stands the old Spanish castle of *Don Juan.* Since 1780 it has remained a ruin, though Nicaragua has always kept a few soldiers here, occupying a shed at the foot of the hill on which the remains of the fort are seen. In the civil wars of the last years this place has repeatedly been occupied and evacuated by the contending powers.

Among the rapids, that of the Castillo Vièjo is the only one that forms a real impediment in the navigation of the river. With the necessary caution canoes may descend, and I myself have passed over it on my way back to the coast in a bongo carrying forty passengers; upward, however, all boats must be towed, after having been unloaded. . . .

Above the region of the rapids the river is almost stagnant, and the designation of the *aguas muertas*, or dead waters, is not inappropriately applied to it. It is a deep and still water, full of fish, with low and swampy banks, on which the palm thickets of the delta reappear.

Beyond this latter portion of the river the Lake of Nicaragua opens to the view. On the little promontory formed by the lake and the inlet of the river the custom-house of Nicaragua, designated by the high-sounding name of the "fort of San Carlos," has been established. There are a few houses at this place, and a small military force is kept up to protect the establishment and, in case of necessity, enforce the payment of the dues. The ruins of an old Spanish castle still exist here, but they are hidden among the trees and shrubs with which they are overgrown.

The view from this elevation has a peculiar character of

grandeur. At the foot of the hill a broad sheet of water is spread, studded, in the immediate neighborhood, with some green islands of diminutive dimensions, and extending, in a northwesterly direction, as far as the eye can reach. To the left, a low wooded shore begins at the outlet of the lake, and continues in that direction till it is lost in the distance of the western horizon. A chain of high mountains, cast in a shroud of dark forests, rises in the rear, covering an unknown region of Costa Rica. It comprises several active volcanoes, which on late occasions have illumined the surface of the lake by their flames and red-hot streams of lava. To the right, the view does not extend beyond the nearest hills; but at a short distance from the lake it ranges over a long line of broken eminences, with the mountain-chain of Chontales in the rear, bordering like a wall the table-land of Upper Mosquitia. Hill and dale, forests and savannas, appear in endless variety in this direction. On the distant horizon in the centre of the view the two cones of the island of Ometepe are seen, faintly traced, and as their forms are lifted upward by refraction, they seem to swim over the water.

At the very spot where the San Juan River leaves the lake the Rio Frio enters it. This is a river coming down from the mountains of Costa Rica, through an absolute wilderness which, it is asserted, has never been trodden by the foot of a civilized man. The dense forests of this region are inhabited by a warlike tribe of Indians who refuse to have any intercourse with the rest of the world. They are said to be of very fair complexion, a statement which has caused the appellation of *Indios blancos* or *Guatusos*,—the latter name being that of an animal of reddish-brown color, and intended to designate the color of their hair. It is stated that not only do they not allow a foreigner to enter their territory, but that they are even in

the habit of killing those of their own people who again fall into their hands after having been away among the civilized inhabitants of the neighboring settlements. . . .

While in California, I heard of a young German, living in the neighborhood of San Francisco, who recounts a little romance of adventures he met with among this people. Though the story was not told to me by the man himself, still, as it was repeated by a trustworthy friend who had derived it from the original source, I may be allowed to introduce it here.

The young man was on his way to California. When at San Carlos he had some difference or quarrel with his travelling companions, and, being afraid of a pistol-ball or a bowie-knife, took the desperate resolution of swimming to the opposite side of the river, where he soon fell into the hands of a body of these Indians. He was tied to a tree, and they then held a council as to the manner—so at least he believed—of putting him to death. Suddenly, however, as it has happened before in similar cases, a young girl, the daughter of the chief, hurried forth, clasped her arms round the neck of my blue-eyed countryman, and gave a favorable turn to his fate.

Of course, he married the girl, and, as the consort of this Indian princess, he spent a few months in the forest, till he was ungrateful enough to forsake his generous bride, and avail himself of an opportunity to swim back to San Carlos, continuing, after this romantic episode, his journey to California.

According to his statements, he would have remained with the Indians had he been able to endure the life in the wilderness, which he found rather too ill-provided with accommodations for enjoying his honeymoon. During the rainy season the tribe lived almost exclusively on the trees, and he speaks in very high terms of the dexterity

with which they would leap from branch to branch, a mode of travelling in which he often found it too difficult to follow his nimble spouse. At the time of each full moon the whole tribe met in council, for which the place was designated from one meeting to the next by the chief, and whatever was done by common agreement was regulated according to the phases of the moon.

Some years before the period of my first arrival in Nicaragua, the officer then in command of the fort of San Carlos fitted out an expedition for the purpose of exploring the country on the Rio Frio, which is known to be rich in gold. This little corps, having hit upon a deserted village of the Indians on the bank of the river, and resting in the shade of some trees in the outskirts of the forest, was suddenly assailed by a shower of arrows, and, with the exception of the commanding officer, who was severely wounded, but succeeded in hiding himself between the reeds till a boat from the fort came to his rescue, every man of the expeditionary force was killed. . . .

Our passage up the river had taken us nine days, making an average progress of about twelve miles per day. Three days more were spent in crossing the lake. With the native boatmen it seems to be a rule to abstain from using oars even when they are becalmed. Before we left the *aguas muertas* a small tree had been cut. This was now erected as a mast, a sail was spread, and slowly we began to move in the direction of Granada. Our navigation was of a very primitive kind. At night, while every soul on board slept soundly, our bongo was left to find its own way, which, however, it refused to do; for when we awoke at dawn I saw we were heading to the place we had come from. By and by, nevertheless, we drew nearer to our point of destination. When we had left the two peaks of Ometepe on one side, the summit of Mombacho, designating

the site of Granada, gradually rose from the water. We passed the island of Zapotera, celebrated for its idols, which have been discovered and described by my friend Mr. Squier. It is uninhabited, and may be said to be a mountain covered with a forest, here and there interrupted by a savanna. Like other islands in this lake, it contains numerous wild animals, such as deer, peccaries, monkeys, and panthers. . . .

On the evening of the 5th of December we doubled the outermost rock of the *Corrales* or *Isletas*, a cluster of more than a hundred diminutive islands at the foot of the Mombacho, and a few hours after dark landed on the *playa*, or beach, of Granada.

THE DESTRUCTION OF SAN SALVADOR.

CARL SCHERZER.

[Dr. Carl Scherzer, in his "Travels in the Free States of Central America," gives a graphic picture of the destruction, in 1854, of the city of San Salvador by an earthquake, as witnessed by his friend Dr. Wagner, whose description of the event is well worth repeating. This city, which stands on a plateau about two thousand feet above the Pacific, was built by the Spaniards in 1528, and, with the exception of Guatemala, was the neatest and handsomest of Central American cities, possessing several handsome churches, a new university, and numerous attractive residences.]

ON the 12th and 13th of April, 1854, there was heard in the upper part of the city, towards the southwest, a hollow, subterranean, rumbling noise, which recurred at short intervals and continued for several minutes, appearing to come from the mountains which form a kind of large semicircle at the foot of the volcano, but there was no shock whatever. On the Good Friday, at half-past seven in the

morning, two slight shocks, quickly succeeding each other, were felt, and about ten minutes afterwards a rather stronger one. The roof and walls of my cottage shook, without my at first perceiving the cause; but a young Spaniard, who waited on me, said, quietly, "*Es un temblor.*" Being a native of the country, he was accustomed to the phenomenon, and thought little of it.

These tremblings and rockings of the earth, that seem so terrible to us Europeans, are such ordinary occurrences in the environs of San Salvador that the district has acquired the name of the "swinging mat;" but these shocks, though frequent, had never been hitherto of the violent and destructive character which they have assumed at Valparaiso and Lima, where about once in a century the destruction of a town is reckoned on as a matter of course.

The volcano of Isalco, too, being in constant activity, and only forty-eight miles south of the city of San Salvador, had always been regarded as a chimney and safety-valve, affording a free vent for the steam and other dangerous products of the subterranean furnace.

The shocks were repeated at tolerably regular intervals, two or three in an hour, during the whole of the Good Friday, and all had the same direction,—namely, from west-southwest to east-northeast; at which point, a league from the town, lies the great crater of Cuscatlan, about five hundred feet above San Salvador.

The ceremonies of the Good Friday proceeded with the accustomed pomp, and people did not think of disturbing their processions, or their visits to the cathedral, on account of the earthquake; though occasionally, when there came a shock rather stronger than usual, some of the devout crowd did turn pale and make a rush towards the doors.

At half-past nine in the evening there came a shock so violent that the houses were shaken to the foundations, the

roofs cracked, plaster and tiles fell, and the walls in many places were rent. The houses are all low and broad, without upper stories, the walls mostly of clay, which is very elastic, and the rafters made of pliable, closely-plaited cane, admirably adapted to resist the most violent shocks; otherwise the houses would have fallen in a mass with this one, which lasted eight seconds, the ground undulating like the ocean. Every one rushed out into the open air, but a full hour passed without any further movement. We determined, nevertheless, not to sleep under a roof; but my countryman, Mr. Kronmeier, the Prussian vice-consul, who came home about eleven o'clock, laughed at our caution, and went to bed as usual in his bedroom. He was used to these unpleasant occurrences; though he confessed that, during a residence of sixteen years in Central America and Mexico, he had never felt in one day so many shocks as during the one just past.

The old volcano of Cuscatlan, from which the shocks appeared to proceed, lies, as I have said, about three miles from the city; viewed from this direction, it forms a beautiful cone, with a gently rounded summit, and its sides are clothed from top to bottom with wood; its crater is still quite perfect, a mile and a half in diameter, and filled with water at the bottom. . . . There exists no certain record of the former activity of this volcano; but according to tradition an eruption of lava from a cleft in its side took place in 1650, and overwhelmed the village of Neliopa; but according to others it was merely an eruption of mud and not of fire. . . .

The morning of Easter Sunday was announced as usual by the firing off of rockets and a joyous burst of military music. The multitude betook themselves in festival procession to the Cathedral, to witness the celebration of high mass; the houses were gayly adorned with branches of

palm and banana-leaves, and the "*Sanctissimum*" was borne in triumph through the streets, followed by crowds of señors and señoritas in their gayest attire. . . . On this Easter Day, as on preceding ones, the people, after having performed their devotions like good Catholics, gave themselves up to festivity and enjoyment, and the day closed with music, feasting, and fireworks.

Immediately after nine o'clock, however, a shock occurred more violent than the strongest felt on the Good Friday. I was unwell with a slight feverish attack, and had gone to bed, but was awakened by the noise. Some walls fell in, many houses were rent, and a part of the ceiling of my room fell, striking me on the head and face, and for some minutes blinding me with the dust. I sprang from my bed, and groped my way to the door, which unluckily I had locked; but after a time I succeeded in getting it open, and made my way to the court-yard, where I found the rest of the inhabitants of the house praying and screaming.

After a few moments had elapsed, however, they had quite got over their fright, and were laughing and joking at their previous consternation and precipitate flight. Unless the houses actually fall, people do not, after the first moment, think much of these shocks, but this time they did take the precaution to put all their doors open, and had their beds carried out into the court. Mine was placed under the gallery of the corridor, and a great deal of compassion was expressed for me when they found I had been a little hurt. A young doctor, who occupied the room next to mine, thought there would be no strong "temblor" again to-night, but an aged priest said that this house was old and decayed, and it was very necessary to be careful. My housemates then went back into their rooms, and, though they kept the doors open, consumed with a good appetite the remainder of the Easter feast, the conversation the

while turning, of course, almost exclusively on the "temblor."

I lay gazing up into the night sky, not at all inclined to sleep. The day had been, as usual, very warm, the thermometer at noon showing 88° Fahrenheit; a heavy mass of clouds (strato-cumulus) lay piled up about the waning moon, but dispersed towards ten o'clock, and the moon then shone brightly through a clear and tranquil atmosphere. A few light scattered clouds of the cirrus and cirro-stratus lay motionless at a few points on the horizon, but there was nothing to portend any unusual phenomenon.

At thirty minutes past ten, however, came the shock that laid the city of San Salvador in ruins. It began with a terrific noise, the earth heaving as if lifted by a subterranean sea; and this movement, and the thunder accompanying it, continued for ten or twelve seconds, while the crash and uproar of falling buildings were still more deafening than the thunder. An immense and blinding cloud of dust arose, through which were heard the shrieks and supplications of the flying people, calling on "Maria Santissima" and all other saints; and at length a hymn, in thousand-voiced chorus, which was heard plainly, through all the other noises, at a distance of a mile and a half from the town, by a family of German emigrants with whom I was acquainted.

I had witnessed many terrible scenes of war and revolution in the Old World, but there at least they were visible enemies of flesh and blood with whom people had to contend; but here were unknown, terrific, incalculable forces at work, of whose nature they had only the vaguest idea. The shocks went on, sometimes stronger, sometimes weaker, and with very brief intervals, until, by the evening of Easter Monday, one hundred and twenty had been counted, and they were accompanied all the time by hollow

thunder and detonations, as if a tremendous battle were raging beneath the earth. People now abandoned all thoughts of their property, and sought only to save their lives, for, with the continual oscillations of the ground in all directions, rents and chasms were opening on it, so that no one knew whether it might not the next moment yawn beneath their feet and engulf every living soul. After every new shock I noticed that the people changed their prayers and the names of the saints they were invoking; but whether the saints did not hear, or could not or would not help them, the subterranean artillery continued to bellow forth its fearful salvos with unmitigated fury.

Towards one in the morning, one of my acquaintances came climbing over the ruined wall of our court-yard to inquire after me, as he knew I was unwell; and he then proposed to me to take a walk through the town by moonlight. We took the direction of the market-place, where the Cathedral stood; and from what I saw I can truly say that the whole city was destroyed, for I did not see a *single* house uninjured. Those that were not lying in ruin had so many rents, and damages of various kinds, as to be quite uninhabitable. The Cathedral—an elegant rather than imposing building—had escaped with less damage than many other churches; but the clock-tower had fallen, the portal was lying in fragments, and the walls were gaping open in two or three places.

The interior of the Franciscan convent, the door of which stood wide open, presented a sad picture of desolation. So many stones had fallen from the roof and such large portions of the walls, that most of the altars lay scattered in fragments, or were covered with rubbish; several of the colossal figures of saints had fallen from the niches, and lay with their finery all covered with dust and stones; but the people, who the day before had been carrying them

about in triumph, now did not trouble themselves any more about them: everybody was occupied in saving his life, or, if possible, his most valuable possessions.

Of the new university buildings only one wing was left standing: it was the one containing the clock-tower, and in this the clock was still going on, regularly striking the hours. The roof of the Episcopal Palace had fallen in, and some stones had struck the sacred head of the bishop with no more ceremony than had been shown towards our profane pates, though this bishop was Don Tomaso Saldana, a man most justly held in high repute for the excellence of his life. Much injury had also been sustained by the President of the Republic, Señor Duenas, who was originally a monk, but afterwards a lawyer and statesman, and perhaps the man of the greatest capacity in the whole country.

The streets were empty and desolate, and we had to scramble over heaps of ruins to get through them: not a creature was to be seen but a few sentinels, and in the interior of the houses also there reigned the stillness of the grave. Even in the broadest streets the people did not think themselves safe, and rich and poor were huddled together indiscriminately in the great square, praying, singing, and screaming whenever a new shock startled them with its terrible explosion; but fortunately, in the midst of all this, the new President, Don José Maria San Martin, showed much presence of mind, and gave his orders for the preservation of property with much composure.

[Fortunately, the previous warning shock had driven most of the people from their houses, a chance which saved most of their lives, though several hundreds were found buried in the ruins.]

The rising sun of Easter Monday morning shone on a mournful spectacle, and the few people who were left in the town wandered about looking pale and worn, the

women with a total disregard of their dress very unusual with them. Among these I noticed the wife of the President, who was entreating him to fly, like so many others, from the scene of danger; but he remained faithful to duty, and was exerting himself vigorously to keep order. He had established a kind of court-martial under a tent in the University Square, before which every thief caught in the act was brought, and, on the evidence of two witnesses against him, immediately shot.

Since the ruins of San Salvador could now no longer offer me a shelter, I set off on foot, at an early hour, towards the hacienda of Mr. Kronmeier, and on the way felt four more shocks, the strongest of which lasted six or seven seconds, and was accompanied by violent oscillations of the ground, and detonations like the salvos from Vesuvius, when, in the lesser eruptions, you stand near the crater while stones are being thrown up. I was now more than ever convinced that the centre of the subterranean action was very near, and that the explosive steam and glowing masses of the interior were seeking a new outlet.

The country-house of Mr. Kronmeier was still standing, but its thick walls had been rent in so many places that it offered only an uncomfortable and insecure shelter. From the steep cliffs on the left of the river's bed masses of rock and earth had fallen, and the hot springs at the foot of the hill had ceased to flow; the mill-stream was dry; one of the cocoa-palms was prostrate, and the whole landscape, so lovely before, had a dejected and melancholy aspect, increased, of course, by the general flight of the inhabitants of the district. . . . The shocks still went on, though they were not so frequent as on the two Easter nights; and, as the subterranean forces were evidently struggling for a new vent, no one could feel himself safe within the sphere of their operations.

Many of the people whom we met, however, were leaving the place, though not so much for any reason of this kind as on account of a prophecy of the worthy bishop, "that before the new moon the whole district of San Salvador, with the ruins of the city, would be swallowed up." But, unluckily for the bishop's character as a prophet, the prediction was not fulfilled.

SCENES IN TRINIDAD AND JAMAICA.

JAMES ANTHONY FROUDE.

[Froude is scarcely known as a traveller, his reputation being founded in another field of literature, that of history. Yet he is the author of two works of travel,—"Oceana," from which we have elsewhere given a selection, and "The English in the West Indies," from which our present selection is derived. He visited most of the British West Indies, and has given picturesque descriptions of them all. We append some extracts from his account of Trinidad.]

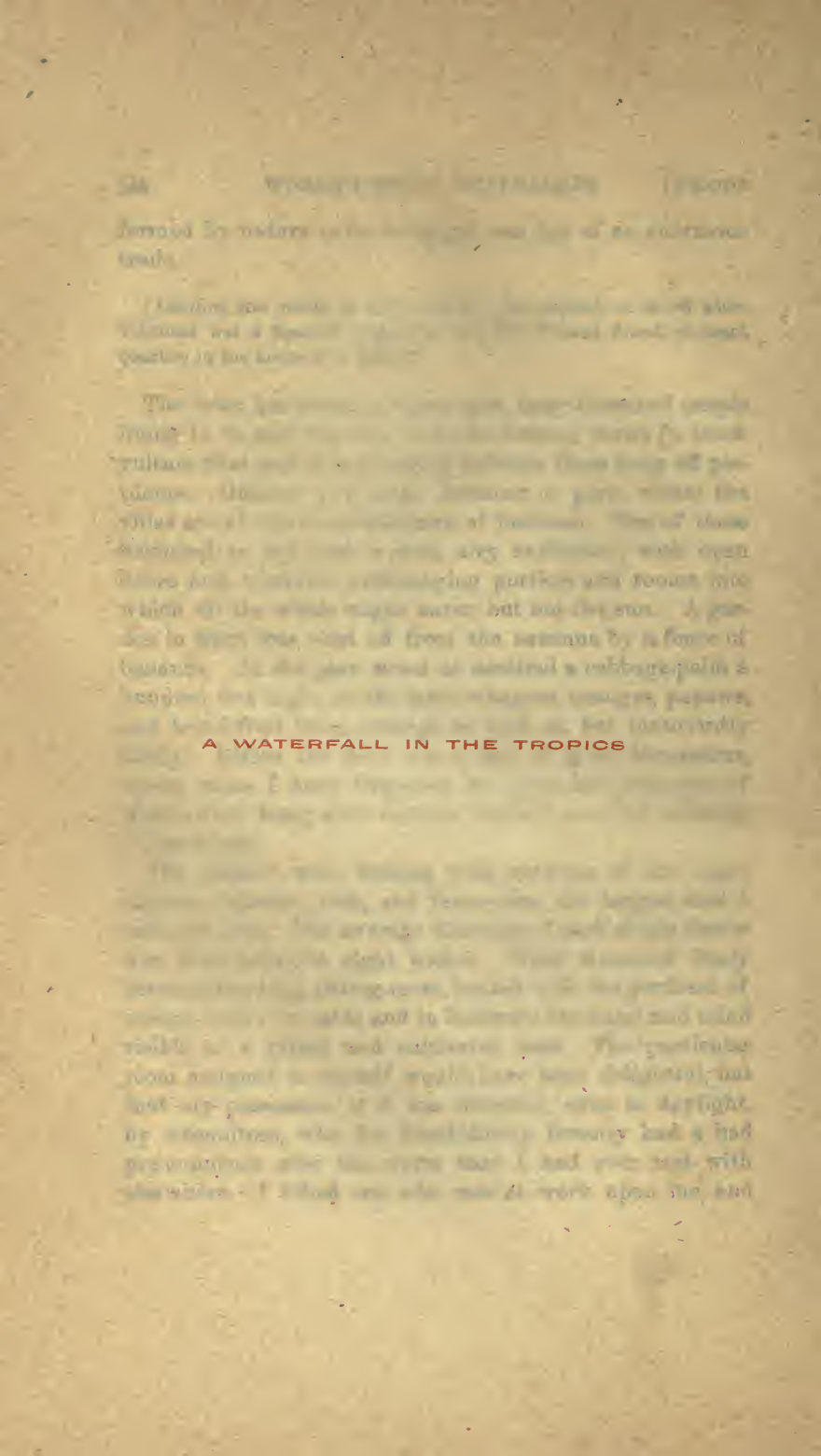
TRINIDAD is the largest, after Jamaica, of the British West Indian Islands, and the hottest absolutely after none of them. It is square-shaped, and, I suppose, was once a part of South America. The Orinoco River and the ocean-currents between them have cut a channel between it and the mainland, which has expanded into a vast shallow lake known as the Gulf of Paria. The two entrances by which the gulf is approached are narrow, and are called *bocas*, or mouths,—one the Dragon's Mouth, the other the Serpent's. When the Orinoco is in flood the water is brackish, and the brilliant violet hue of the Caribbean Sea is changed to a dirty yellow; but the harbor which is so formed would hold all the commercial navies of the world, and seems

formed by nature to be the depot one day of an enormous trade.

[Landing was made at Port of Spain, the capital, so called when Trinidad was a Spanish possession, and Mr. Froude found pleasant quarters in the house of a friend.]

The town has between thirty and forty thousand people living in it, and the rain and the Johnny crows [a black vulture that acts as scavenger] between them keep off pestilence. Outside is a large savanna or park, where the villas are of the successful men of business. One of these belonged to my host, a cool, airy habitation, with open doors and windows, overhanging portico, and rooms into which all the winds might enter, but not the sun. A garden in front was shut off from the savanna by a fence of bananas. At the gate stood as sentinel a cabbage-palm a hundred feet high; on the lawn mangoes, oranges, papaws, and bread-fruit-trees, strange to look at, but luxuriantly shady. Before the door was a tree of good dimensions, whose name I have forgotten, the stem and branches of which were hung with orchids which G—— had collected in the woods.

The borders were blazing with varieties of the single hibiscus, crimson, pink, and fawn-color, the largest that I had ever seen. The average diameter of each single flower was from seven to eight inches. Wind streamed freely through the long sitting-room, loaded with the perfume of orange-trees; on table and in bookcase the hand and mind visible of a gifted and cultivated man. The particular room assigned to myself would have been delightful, but that my possession of it was disputed, even in daylight, by mosquitoes, who for blood-thirsty ferocity had a bad pre-eminence over the worst that I had ever met with elsewhere. I killed one who was at work upon me, and



A WATERFALL IN THE TROPICS

examined him through a glass. Bewick, with the inspiration of genius, had drawn his exact likeness as the devil,—a long black stroke for a body, a nick for a neck, horns on the head, and a beak for a mouth, spindle arms, and longer spindle legs, two pointed wings, and a tail. Line for line, there the figure was before me, which in the unforgetable tail-piece is driving the thief under the gallows, and I had a melancholy satisfaction in identifying him. I had been warned to be on the lookout for scorpions, centipedes, jiggers, and land-crabs, who would bite me if I walked slipperless over the floor in the dark. Of these I met with none, either there or anywhere, but the mosquito of Trinidad is enough by himself. For malice, mockery, and venom of tooth and trumpet he is without a match in the world.

From mosquitoes, however, one could seek safety in tobacco-smoke, or hide behind the lace curtains with which every bed is provided. Otherwise I found every provision to make life pass deliciously. To walk is difficult in a damp, steamy atmosphere, hotter during daylight than the hottest forcing-house in Kew. . . . Beautiful, however, it was beyond dispute. Before sunset a carriage took us around the savanna. Tropical human beings, like tropical birds, are fond of fine colors, especially black human beings, and the park was as brilliant as Kensington Gardens on a Sunday. At nightfall the scene became even more wonderful, air, grass, and trees being alight with fireflies, each as brilliant as an English glow-worm. The palm-tree at our own gate stood like a ghostly sentinel clear against the starry sky, a single long dead frond hanging from below the coronet of leaves and clashing against the stem as it was blown to and fro by the night-wind, while long-winged bats swept and whistled over our heads.

[The governor's residence and the botanical gardens next call for attention.]

The "Residence" stands in a fine situation, in large grounds of its own, at the foot of the mountains. It has been lately built, regardless of expense, for the colony is rich, and likes to do things handsomely. On the lawn, under the windows, stood a tree which was entirely new to me, an enormous ceiba or silk-cotton-tree, umbrella-shaped, fifty yards in diameter, the huge and buttressed trunk throwing out branches so massive that one wondered how any woody fibre could bear the strain of their weight, the boughs twisting in and out till they made a roof over one's head, which was hung with every fantastic variety of parasites.

Vast as the ceibas were which I saw afterwards in other parts of the West Indies, this was the largest. The ceiba is the sacred tree of the negro, the temple of Jumbi, the proper house of Obeah. To cut down one is impious. No black in his right mind would wound even the bark. A Jamaica police officer told me that if a ceiba had to be removed, the men who used the axe were well dosed with rum to give them courage to defy the devil.

From Government House we strolled into the adjoining Botanical Gardens. I had long heard of the wonders of these. The reality went beyond description. Plants with which I was familiar as *shrubs* in English conservatories were here expanded into forest giants, with hundreds of others of which we cannot raise even Liliputian imitations. Let man be what he will, nature in the tropics is always grand. Palms were growing in the greatest luxuriance, of every known species, from the cabbage towering up into the sky to the fan-palm of the desert whose fronds are reservoirs of water.

Of exogenous trees the majority were leguminous in

some shape or other, forming flowers like a pea or vetch and hanging their seeds in pods; yet in shape and foliage they distanced far the most splendid ornaments of an English park. They had Old-World names with characters wholly different: cedars which were not conifers, almonds which were no relations of peaches, and gum-trees as unlike eucalypti as one tree can be unlike another.

Again, you saw ferns which you seemed to recognize till some unexpected anomaly startled you out of your mistake. A gigantic Portugal laurel, or what I took for such, was throwing out a flower direct from the stem like a cactus. Grandest among them all, and happily in full bloom, was the sacred tree of Burmah, the *Amherstia nobilis*, at a distance like a splendid horse-chestnut, with crimson blossoms in pendent bunches, each separate flower in the convolution of its parts exactly counterfeiting a large orchid, with which it had not the faintest affinity, the Amherstia being leguminous like the rest.

Underneath, and dispersed among the imperial beauties, were spice-trees, orange-trees, coffee plants, and cocoa, or again, shrubs with special virtues or vices. We had to be careful what we were about, for fruits of fairest appearance were tempting us all round. My companion was preparing to eat something to encourage me to do the same. A gardener stopped him in time. It was nux vomica. I was straying along a less frequented path, conscious of a heavy vaporous odor, in which I might have fainted had I remained exposed to it. I was close to a manchineel-tree.[1]

Prettiest and freshest were the nutmegs, which had a glen all to themselves and perfumed the surrounding air. In Trinidad and in Grenada I believe the nutmegs are the largest that are known, being from thirty to forty feet high; leaves brilliant green, something like the leaves of an orange, but extremely delicate and thin, folded one over

the other, the lowest branches sweeping to the ground till the whole tree forms a natural bower, which is proof against a tropical shower. The fragrance attracts moths and flies; not mosquitoes, who prefer a ranker atmosphere. I saw a pair of butterflies the match of which I do not remember even in any museum, dark blue shot with green like a peacock's neck, and the size of English bats. I asked a black boy to catch me one. "That sort no let catchee, massa," he said; and I was penitently glad to hear it.

Among the wonders of the garden are the vines, as they call them, that is, the creepers of various kinds that climb about the other trees. Standing in an open space there was what once had been a mighty "cedar." It was now dead, only the trunk and dead branches remaining, and had been murdered by a "fig"-vine which had started from the root, twined itself like a python round the stem, strangled out the natural life, and spreading out in all directions, had covered boughs and twigs with a foliage not its own. So far the "vine" had done no worse than ivy does at home, but there was one feature about it which puzzled me altogether. The lowest of the original branches of the cedar were about twenty feet above our heads. From these in four or five places the parasite had let fall shoots, perhaps an inch in diameter, which descended to within a foot of the ground and then suddenly, without touching that or anything, formed a bight like a rope, went straight up again, caught hold of the branch from which they started, and so hung suspended exactly as an ordinary swing.

In three distinctly perfect instances the "vine" had executed this singular evolution, while at the extremity of one of the longest and tallest branches high up in the air it had made a clean leap of fifteen feet without visible help and had caught hold of another tree adjoining on the

same level. These performances were so inexplicable that I conceived that they must have been a freak of the gardener's. I was mistaken. He said that at particular times in the year the fig-vine threw out fine tendrils which hung downward like strings. The strongest among them would lay hold of two or three others and climb up upon them, the rest would die and drop off, while the successful one, having found support for itself above, would remain swinging in the air and thicken and prosper. The leap he explained by the wind. I retained a suspicion that the wind had been assisted by some aspiring energy in the plant itself, so bold it was and so ambitious.

But the wonders of the garden were thrown into the shade by the cottage at the extreme angle of it, where Kingsley* had been the guest of Sir Arthur Gordon. It is a long straggling wooden building with deep verandas lying in a hollow overshadowed by trees, with views opening out into the savanna through arches formed by clumps of tall bamboos, the canes growing thick in circular masses and shooting up a hundred feet into the air, where they meet and form frames for the landscape, peculiar and even picturesque when there are not too many of them. These bamboos were Kingsley's special delight, as he had never seen the like of them elsewhere. The room in which he wrote is still shown, and the gallery where he walked up and down with his long pipe. His memory is cherished in the island as of some singular and beautiful presence which still hovers about the scenes which so delighted him in the closing evening of his own life.

[Happiness makes its home with the negroes of Trinidad, whom nature keeps in pristine idleness. They have little to do other than to pull and eat.]

---

* Charles Kingsley, who wrote here his "At Last," descriptive of tropical scenes.

In Trinidad there are eighteen thousand freeholders, most of them negroes and representatives of the old slaves. Their cabins are spread along the road on either side, overhung with bread-fruit-trees, tamarinds, calabash-trees, out of which they make their cups and water-jugs; the luscious granadilla climbs among the branches; plantains throw their cool shade over the doors; oranges and limes and citrons perfume the air, and droop their boughs under the weight of their golden burdens. There were yams in the gardens and cows in the paddocks, and cocoa-bushes loaded with purple or yellow pods. Children played about in swarms in happy idleness and abundance, with schools, too, at intervals, and an occasional Catholic chapel, for the old religion prevails in Trinidad, never having been disturbed.

What form could human life assume more charming than that which we were now looking on? Once more, the earth does not contain any peasantry so well off, so well cared for, so happy, so sleek and contented as the sons and daughters of the emancipated slaves in the English West Indian Islands. Sugar may fail the planter, but cocoa, which each peasant can grow with small effort for himself, does not fail and will not. He may "better his condition," if he has any such ambition, without stirring beyond his own ground, and so far, perhaps, his ambition may extend, if it is not turned off upon politics.

Even the necessary evils of the tropics are not many or serious. His skin is proof against mosquitoes. There are snakes in Trinidad as there were snakes in Eden. "Plenty snakes," said one of them who was at work in his garden, "plenty snakes, but no bitee." As to costume, he would prefer the costume of innocence if he were allowed. Clothes in such a climate are superfluous for warmth, and to the minds of the negroes, unconscious as they are of shame,

superfluous for decency. European prejudice, however, still passes for something; the women have a love for finery, which would prevent a complete return to African simplicity; and in the islands which are still French, and in those like Trinidad, which the French originally colonized, they dress themselves with real taste. They hide their wool in red or yellow handkerchiefs, gracefully twisted; or perhaps it is not only to conceal the wool. Columbus found the Carib women of the island dressing their hair in the same fashion.

The water-works, when we reached them, were even more beautiful than we had been taught to expect. A dam has been driven across a perfectly limpid mountain stream; a wide open area has been cleared, levelled, strengthened with masonry, and divided into deep basins or reservoirs, through which the current continually flows. Hedges of hibiscus shine with crimson blossoms. Innumerable humming-birds glance to and fro among the trees and shrubs, and gardens and ponds are overhung by magnificent bamboos, which so astonished me by their size that I inquired if their height had been measured. One of them, I was told, had lately fallen, and was found to be one hundred and thirty feet long. A single drawback only there was to this enchanting spot, and it was again the snakes. There are huge pythons in Trinidad which are supposed to have crossed the straits from the continent. Some washer-women at work in the stream had been disturbed a few days before our visit by one of these monsters, who had come down to see what they were about. They are harmless, but trying to the nerves.

[We shall conclude this selection with a leap from Trinidad to Jamaica, and the relation of an adventure experienced by our author in that island. He was on his way back from an excursion into the island.]

The train from Porus brought us back to Kingston an hour before sunset. The evening was lovely, even for Jamaica. The sea-breeze had fallen, the land-breeze had not risen, and the dust lay harmless on road and hedge. Cherry Garden, to which I was bound, was but seven miles distant by the direct road, so I calculated on a delightful drive which would bring me to my destination before dark.

So I calculated; but alas! for human expectation. I engaged a "buggy" at the station, with a decent-looking conductor, who assured me that he knew the way to Cherry Garden as well as to his own door. His horse looked starved and miserable. He insisted that there was not another in Kingston that was more than a match for it. We set out, and for the first two or three miles we went on well enough, conversing amicably on things in general. But it so happened that it was market day. The road was thronged with women plodding along with their baskets on their heads, a single male on a donkey to each detachment of them, carrying nothing, like an officer with a detachment of soldiers.

Foolish indignation rose in me, and I asked my friend if he was not ashamed of seeing the poor creatures toiling so cruelly, while their lords and masters amused themselves. I appealed to his feelings as a man, as if it were likely that he had got any. The wretch only laughed. "Ah, massa," he said, with his tongue in his cheek, "women do women's work, men do men's work,—all right." "And what is men's work?" I asked. Instead of answering he went on, "Look at they women, massa,—how they laugh, how happy they be! Nobody more happy than black woman, massa."

I would not let him off. I pricked into him, till he got excited too, and we argued and contradicted each other, till at last the horse, finding he was not attended to, went his own way, and that was a wrong one. Between Kings-

ton and our destination there is a deep sandy flat, overgrown with brush and penetrated in all directions with labyrinthine lanes. Into this we had wandered in our quarrels, and neither of us knew where we were. The sand was loose; our miserable beast was above his fetlocks in it, and was visibly drooping under his efforts to drag us along even at a walk.

The sun went down. The tropic twilight is short. The evening star shone out in the west, and the crescent moon over our heads. My man said this and said that; every word was a lie, for he had lost his way and would not allow it. We saw a light through some trees. I sent him to inquire. We were directed one way and another way, every way except the right one. We emerged at last upon a hard road of some kind. The stars told me the general direction. We came to cottages where the name of Cherry Garden was known, and we were told that it was two miles off; but alas! again there were two roads to it,—a short and good one and a long and bad one, and they sent us by the last. There was a steep hill to climb, for the house is eight hundred feet above the sea. The horse could hardly crawl, and my "nigger" went to work to flog him to let off his own ill-humor. I had to stop that by force, and at last, as it grew too dark to see the road under the trees, I got out and walked, leaving him to follow at a foot's pace. The night was lovely. I began to think that we should have to camp out after all, and that it would be no great hardship.

It was like the gloaming of a June night in England, the daylight in the open spots not entirely gone, and mixing softly with the light of moon and planet and the flashing of the fireflies. I plodded on, mile after mile, and Cherry Garden still receded to one mile farther. We came to a gate of some consequence. The outline of a large mansion

was visible, with gardens round it. I concluded that we had arrived, and was feeling for the latch when the forms of a lady and gentleman appeared against the sky who were strolling in the grounds. They directed me still upward, with the mile which never diminished still to be travelled.

Like myself, our weary animal had gathered hopes from the sight of the gate. He had again to drag on as he could. His owner was subdued and silent, and obeyed whatever order I gave him. The trees now closed over us so thick that I could see nothing. Vainly I repented of my unnecessary philanthropy, which had been the cause of the mischief; what had I to do with black women, or white either, for that matter? I had to feel the way with my feet and a stick. I came to a place where the lane again divided. I tried the nearest turn. I found a trench across it three feet deep, which had been cut by a torrent. This was altogether beyond the capacity of our unfortunate animal, so I took the other boldly, prepared, if it proved wrong, to bivouac till morning with my "nigger," and go on with my argument.

Happily there was no need; we came again on a gate which led into a field. There was a drive across it and wire fences. Finally lights began to glimmer and dogs to bark: we were at the real Cherry Garden at last, and found the whole household alarmed for what had become of us.

I could not punish my misleader by stinting his fare, for I knew that I had only myself to blame. He was an honest fellow after all. In the disturbance of my mind I left a rather valuable umbrella in his buggy. He discovered it after he had gone, and had grace enough to see that it was returned to me. My entertainers were much amused at the cause of the misadventure, perhaps unique

of its kind: to address homilies to the black people on the treatment of their wives not being the fashion in those parts.

THE HIGH WOODS OF TRINIDAD.

CHARLES KINGSLEY.

[The skilled and popular novelist to whom we owe our present selection seems to have entertained for years a vivid wish to see the glory of the tropics, the achievement of which desire is put upon record in "At Last," the work from which we quote. In his "Westward Ho" he had years before given a warmly-delineated imaginary picture of the tropics, but waited for years afterwards to see these scenes in their picturesque reality. He tells well the story of the tropical "High Woods."]

AND now we set ourselves to walk to the depot, where the government timber was being felled, and the real "High Woods" to be seen at last. Our path lay along the half-finished tramway, through the first cacao plantation I had ever seen, though, I am happy to say, not the last by many a one.

Imagine an orchard of nut-trees, with very large, long leaves. Each tree is trained to a single stem. Among them, especially near the path, grow plants of the common hot-house Datura, its long white flowers perfuming all the air. They have been planted as landmarks, to prevent the young cacao-trees being cut over when the weeds are cleared. Among them, too, at some twenty yards apart, are the stems of a tree looking much like an ash, save that it is inclined to throw out broad spurs like a ceiba. You look up and see that they are Bois immortelles, fifty or sixty feet high, one blaze of vermilion against the blue sky.

Those who have stood under a Lombardy poplar in early spring and looked up at its buds and twigs showing like pink coral against the blue sky, and have felt the beauty of the sight, can imagine faintly—but only faintly—the beauty of these "madres de cacao,"—cacao mothers, as they call them here,—because their shade is supposed to shelter the cacao-trees, while the dew collected by their leaves keeps the ground below always damp.

I turned my dazzled eyes down again and looked into the delicious darkness under the bushes. The ground was brown with fallen leaves, or green with ferns; and here and there a slant ray of sunlight pierced through the shade, and flashed on the brown leaves, and on a gray stem, and on a crimson jewel which hung on the stem, and there, again, on a bright orange one; and as my eye became accustomed to the darkness, I saw that the stems and larger boughs far away into the wood were dotted with pods, crimson, or yellow, or green, of the size and shape of a small hand closed with the fingers straight out. They were the cacao-pods, full of what are called at home cacao-nibs. And there lay a heap of them, looking like a heap of gay flowers; and by them sat their brown owner, picking them to pieces and laying the seeds to dry on a cloth. I went up and told him that I came from England, and never saw cacao before, though I had been eating and drinking it all my life; at which news he grinned amusement till his white teeth and eyeballs made a light in that dark place, and offered me a fresh broken pod, that I might taste the pink sour sweet pulp in which the rows of the nibs lie packed, a pulp which I found very pleasant and refreshing.

He dries his cacao-nibs in the sun, and, if he be a well-to-do and careful man, on a stage with wheels, which can be run into a little shed on the slightest shower of rain;

picks them over and over, separating the better quality from the worse; and at last sends them down on mule-back to the sea, to be sold in London as Trinidad cocoa, or perhaps in Paris to the chocolate-makers, who convert them into chocolate, "Menier" or other, by mixing them with sugar and vanilla—both, possibly, from this very island. This latter fact once inspired an adventurous German with the thought that he could make chocolate in Trinidad just as well as in Paris. And (so goes the story) he succeeded; but the fair Creoles would not buy it. It could not be good; it could not be the real article, unless it had crossed the Atlantic twice to and fro from that centre of fashion, Paris. So the manufacture, which might have added greatly to the wealth of Trinidad, was given up, and the ladies of the island eat naught but French chocolate, costing, it is said, nearly four times as much as home-made chocolate need cost.

As we walked on through the trace (for the tramway here was still unfinished), one of my kind companions pointed out a little plant, which bears in the island the ominous name of the Brinvilliers. It is one of those deadly poisons too common in the bush, and too well known to the negro Obi-men and Obi-women. And as I looked at the insignificant weed, I wondered how the name of that wretched woman should have spread to this remote island, and have become famous enough to be applied to a plant. French negroes may have brought the name with them; but then arose another wonder. How were the terrible properties of the plant discovered? How eager and ingenious must the human mind be about the devil's work, and what long practice—considering its usual slowness and dulness—must it have had at the said work, ever to have picked out this paltry thing among the thousand weeds of the forest as a tool for its jealousy and revenge!

It may have taken ages to discover the Brinvilliers, and ages more to make its poison generally known. Why not? As the Spaniards say, "The devil knows many things, because he is old." Surely this is one of the many facts which point towards some immensely ancient civilization in the tropics, and a civilization which may have had its ugly vices and have been destroyed thereby.

Now we left the cacao grove; and I was aware on each side of the trace of a wall of green, such as I had never seen before on earth, not even in my dreams,—strange colossal shapes towering up a hundred feet and more in height, which, alas! it was impossible to reach, for on either side of the trace were fifty yards of half-cleared ground, fallen logs, withes, huge stumps ten feet high, charred and crumbling, and among them and over them a wilderness of creepers and shrubs, and all the luxuriant young growth of the "rastrajo," which springs up at once whenever the primeval forest is cleared,—all utterly impassable. These rastrajo forms, of course, were all new to me. I might have spent weeks in botanizing merely at them; but all I could remark, or cared to remark, there as in other places, was the tendency in the rastrajo towards growing enormous rounded leaves. How to get at the giants behind was the only question for one who for forty years had been longing for one peep at Flora's fairy palace, and saw its portals open at last. There was a deep gully before us, where a gang of convicts was working at a wooden bridge for the tramway, amid the usual abysmal mud of the tropic wet season, and on the other side of it there was no rastrajo right and left of the trace. I hurried down it like any school-boy, dashing through mud and water, hopping from log to log, regardless of warnings and offers of help from good-natured negroes, who expected the respectable elderly "buccra" to come to grief, struggled

perspiring up the other side of the gully, and then dashed away to the left, and stopped short, breathless with awe, in the primeval forest at last.

In the primeval forest, looking upon that upon which my teachers and masters, Humboldt, Spix, Martius, Schomburgk, Waterton, Bates, Wallace, Gosse, and the rest, had looked already, with far wiser eyes than mine, comprehending somewhat at least of its wonders, while I could only stare in ignorance. There was actually, then, such a sight to be seen on earth, and it was not less, but far more, wonderful than they had said.

My first feeling on entering the high woods was helplessness, confusion, awe, all but terror. One is afraid at first to venture in fifty yards. Without a compass, or the landmark of some opening to or from which he can look, a man must be lost in the first ten minutes, such a sameness is there in the infinite variety. That sameness and variety make it impossible to give any general sketch of the forest. Once inside "you cannot see the wood for the trees." You can only wander on as far as you dare, letting each object impress itself on your mind as it may, and carrying away a confused recollection of innumerable perpendicular lines all straining upward, in fierce competition, towards the light-food far above; and next of a green cloud, or rather mist, which hovers round your head, and rises thickening to an unknown height. The upward lines are of every possible thickness, and of almost every possible hue; what leaves they bear, being for most part on the tips of the twigs, give a scattered, mist-like appearance to the under foliage.

For the first moment, therefore, the forest seems more open than an English wood. But try to walk through it, and ten steps undeceive you. Around your knees are probably Mamures, with creeping stems and fan-shaped leaves,

something like those of a young cocoa-nut-palm. You try to brush through them, and are caught up instantly by a string or wire belonging to some other plant. You look up and round, and then you find that the air is full of wires,—that you are hung up in a net-work of fine branches belonging to half a dozen different sorts of young trees, and intertwined with as many different species of slender creepers. You thought at your first glance among the tree-stems that you were looking through open air; you find that you are looking through a labyrinth of wire rigging, and must use the cutlass right and left at every five steps.

You push on into a bed of strong sedge-like Sclerias, with cutting edges to their leaves. It is well for you they are only three and not six feet high. In the midst of them you run against a horizontal stick, triangular, rounded, smooth, green. You take a glance along it right and left, and see no end to it either way, but gradually discover that it is the leaf-stalk of a young Cocorite palm. The leaf is five-and-twenty feet long, and springs from a huge ostrich plume, which is sprawling out of the ground and up above your head a few yards off. You cut the leaf-stalk through right and left and walk on, to be stopped suddenly (for you get so confused by the multitude of objects that you never see anything till you run against it) by a gray lichen-covered bar as thick as your ankle. You follow it up with your eye, and find it entwine itself with three or four other bars, and roll over with them in great knots, and festoons, and loops twenty feet high, and then go up with them into the green cloud over your head, and vanish, as if a giant had thrown a ship's cable into the tree-tops.

One of them, so grand that its form strikes even the negro and the Indian, is a Liantasse. You see that at once by the form of its cable,—six or eight inches across in

one direction, and three or four in another, furbelowed all down the middle into regular knots, and looking like a chain cable between two flexible bars. At another of the loops, about as thick as your arm, your companion, if you have a forester with you, will spring joyfully. With a few blows of his cutlass he will sever it as high up as he can reach, and again below, some three feet down; and, while you are wondering at this seemingly wanton destruction, he lifts the bar on high, throws his head back, and pours down his thirsty throat a pint or more of pure cold water. This hidden treasure is, strange as it may seem, the ascending sap, or rather the ascending pure rain-water which has been taken up by the roots, and is hurrying aloft, to be elaborated into sap, and leaf, and flower, and fruit, and fresh tissue for the very stem up which it originally climbed, and therefore it is that the woodman cuts the water-vine through first at the top of the piece which he wants, and not at the bottom; for so rapid is the ascent of the sap, that if he cut the stem below, the water would have all fled upward before he could cut it off above.

Meanwhile, the old story of Jack and the Bean-stalk comes into your mind. In such a forest was the old dame's hut, and up such a bean-stalk Jack climbed, to fight a giant and a castle high above. Why not? What may not be up there? You look up into the green cloud, and long for a moment to be a monkey. There may be monkeys up there over your head,—burly red Howler, or tiny peevish Sapajou, peering down at you, but you cannot peer up at them. The monkeys, and the parrots, and the humming-birds, and the flowers, and all the beauty, are upstairs—up above the green cloud. You are in "the empty nave of the cathedral," and the service is being celebrated aloft in the blazing roof.

We will hope that, as you look up, you have not been careless enough to walk on, for if you have you will be tripped up at once; nor to put your hand out incautiously to rest it against a tree, or what not, for fear of sharp thorns, ants, and wasp-nests. If you are all safe, your next steps, probably, as you struggle through the bush between tree-trunks of every possible size, will bring you face to face with huge upright walls of seeming boards, whose rounded edges slope upward till, as your eye follows them, you find them enter an enormous stem, perhaps round, like one of the Norman pillars of Durham nave, and just as huge; perhaps fluted, like one of William of Wykeham's columns at Winchester.

There is the stem, but where is the tree? Above the green cloud. You struggle up to it between two of the board walls, but find it not so easy to reach. Between you and it are half a dozen tough strings which you had not noticed at first,—the eye cannot focus itself rapidly enough in this confusion of distances,—which have to be cut through ere you can pass. Some of them are rooted in the ground, straight and tense; some of them dangle and wave in the wind at every height. What are they? Air-roots of wild pines, or of Matapalos, or of figs, or of Seguines, or of some other parasite? Probably; but you cannot see. All you can see is, as you put your chin close against the trunk of the tree and look up, as if you were looking up against the side of a great ship set on end, that some sixty or eighty feet up in the green cloud arms as big as English forest-trees branch off, and that out of their forks a whole green garden of vegetation has tumbled down twenty or thirty feet, and half climbed up again.

You scramble round the tree to find whence this aërial garden has sprung: you cannot tell. The tree-trunk is

smooth and free from climbers, and that mass of verdure may belong possibly to the very cables which you met ascending into the green cloud twenty or thirty yards back, or to that impenetrable tangle a dozen yards on, which has climbed a small tree, and then a taller one again, and then a taller still, till it has climbed out of sight, and possibly into the lower branches of the big tree. And what are their species? What are their families? Who knows? Not even the most experienced woodman or botanist can tell you the names of plants of which he only sees the stems. The leaves, the flowers, the fruit, can only be examined by felling the tree; and not even always then, for sometimes the tree, when cut, refuses to fall, linked as it is by chains of liane to all the trees around. Even that wonderful water-vine which we cut through just now may be one of three or even four different plants. . . .

And where are the famous Orchids? They perch on every bough and stem; but they are not, with three or four exceptions, in flower in the winter; and if they were, I know nothing about them; at least I know enough to know how little I know. Whosoever has read Darwin's "Fertilization of Orchids," and finds in his own reason that the book is true, had best say nothing about the beautiful monsters till he has seen with his own eyes more than his master.

And yet even the three or four that are in flower are worth going many a mile to see. In the hot-house they seem almost artificial from their strangeness; but to see them "natural," on natural boughs, gives a sense of their reality which no unnatural situation can give. Even to look up at them perched on bough and stem, as one rides by, and to guess what exquisite and fantastic form may issue, in a few months or weeks, out of those fleshy, often unsightly, leaves, is a strange pleasure,—a spur to the

fancy which is surely wholesome, if we will but believe that all these things were invented by a Fancy, which desires to call out in us, by contemplating them, such small fancy as we possess, and to make us poets, each according to his power, by showing a world in which, if rightly looked at, all is poetry.

Another fact will soon force itself on your attention, unless you wish to tumble down and get wet up to your knees. The soil is furrowed everywhere by holes, by graves some two or three feet wide and deep, and of uncertain length and shape, often wandering about for thirty or forty feet, and running confusedly into each other. They are not the work of man, nor of an animal, for no earth seems to have been thrown out of them. In the bottom of the dry graves you sometimes see a decaying root; but most of them just now are full of water, and of tiny fish also, which burrow in the mud, and sleep during the dry season, to come out and swim during the wet. These graves are, some of them, plainly quite new. Some, again, are very old, for trees of all sizes are growing in them and over them.

What makes them? A question not easily answered. But the shrewdest foresters say that they have held the roots of trees now dead. Either the tree has fallen, and torn its roots out of the ground, or the roots and stumps have rotted in their place, and the soil above them has fallen in.

But they must decay very quickly, these roots, to leave their quiet fresh graves thus empty; and—now one thinks of it—how few fallen trees, or even dead sticks, there are about. An English wood, if left to itself, would be cumbered with fallen timber; and one has heard of forests in North America through which it is all but impossible to make way, so high are piled up, among the still growing

trees, dead logs in every stage of decay. Such a sight may be seen in Europe among the high silver-fir forests of the Pyrenees. How is it not so here? How, indeed? And how comes it—if you will look again—that there are few or no fallen leaves, and actually no leaf-mould? In an English wood there would be a foot—perhaps two feet—of black soil, renewed by every autumn leaf-fall. Two feet? One has heard often enough of bison-hunting in Himalayan forests among Deodaras one hundred and fifty feet high, and scarlet rhododendrons thirty feet high, growing in fifteen or twenty feet of leaf- and timber-mould. And here, in a forest equally ancient, every plant is growing out of the bare yellow loam as it might in a well-hoed garden-bed. Is it not strange?

Most strange, till you remember where you are,—in one of Nature's hottest and dampest laboratories. Nearly eighty inches of yearly rain and more than eighty degrees of perpetual heat make swift work with vegetable fibre, which, in our cold and sluggard clime, would curdle into leaf-mould, perhaps into peat. Far to the north, in poor old Ireland, and far to the south, in Patagonia, begin the zones of peat, where dead vegetable fibre, its treasures of light and heat locked up, lies all but useless age after age. But this is the zone of illimitable sun-force, which destroys as swiftly as it generates, and generates again as swiftly as it destroys. Here, when the forest giant falls, as some tell me that they have heard him fall, on silent nights, when the cracking of the roots below and the lianes aloft rattles like musketry through the woods, till the great trunk comes down, with a boom as of a heavy gun, re-echoing on from mountain-side to mountain-side; then

> "Nothing in him that doth fade,
> But doth suffer an *air*-change
> Into something rich and strange."

Under the genial rain and genial heat, the timber-tree itself, all its tangled ruin of lianes and parasites, and the boughs and leaves, snapped off not only by the blow, but by the very wind of the falling tree, all melt away swiftly and peacefully in a few months—say almost a few days—into the water, and carbonic acid, and sunlight out of which they were created at first, to be absorbed instantly by the green leaves around, and, transmuted into fresh forms of beauty, leave not a wrack behind. Explained thus,—and this I believe to be the true explanation,—the absence of leaf-mould is one of the grandest, as it is one of the most startling, phenomena of the forest.

[And thus the writer rambles on, telling fresh marvels of the tropic woods, from which a knowledge is attained that "defies all analysis."]

[It is that of] the causes and effects of their beauty; that "æsthetic" of plants, of which Schleiden has spoken so well in that charming book of his, "The Plant," which all should read who wish to know somewhat of "The Open Secret." But when they read it let them read with open hearts. For that same "Open Secret" is, I suspect, one of those which God may hide from the wise and prudent, and yet reveal to babes.

At least, so it seemed to me, the first day that I went, awe-struck, into the High Woods; and so it seemed to me, the last day that I came, even more awe-struck, out of them.

ANIMALS OF BRITISH GUIANA.

C. BARRINGTON BROWN.

[British Guiana, the land which seems so strongly inclined to extend its borders at the expense of Venezuela, is as yet very far from being the active and well-developed settlement which might be imagined from the aggressiveness of its rulers. Mr. Brown's story of it indicates a land of which nature is still largely the lord, and which is so little known that he, as late as twenty years ago, was able to discover a river and a cataract not previously heard of. The selection we append, descriptive of the wild animals of the country, is significant of an undeveloped land. Mr. Brown, in his "Canoe and Camp Life in British Guiana," describes a number of unsuccessful efforts to shoot jaguars, and continues:]

ONE of the men happened to go a few yards behind one of our camping-places, when he heard a movement behind him; turning round he saw a jaguar leisurely surveying him. He fled to the camp with his story, and I went in search of the animal accompanied by one man armed with a cutlass. We did not go far before we saw its tracks in the sandy bed of a dry water-course, and concluded that it had gone off. We gave up all hopes of seeing it, and, turning round, were on the point of making our way back to camp, when my companion suddenly exclaimed, "Look! look! the tiger!" Glancing at the spot indicated I saw it crouching in a thicket with its head bent down, its body swaying from side to side, glaring at us with eyes of a greenish metallic hue. The brute had evidently been following us whilst we were searching for it, and was working itself into a rage. I took as good aim at its head as I could, and fired; but instead of seeing it lying dead, I

heard it bounding and crashing through the forest at a fearful pace.

One of my men got a shot at a jaguar on a sand-beach, where it passed within twenty feet of him, as he crouched on some rocks. The only effect the shot had on the animal was to make it gallop away a few yards, then turn for an instant and look at him. The men whom I left in charge on the New River cut open a hollow log containing young accouries, and took them out. Their squeals on being seized attracted a puma, which ran close up to the men, apparently wishing to get the accouries, when one of them fired at it and it made off.

One evening, whilst returning to camp along the portage path that we were cutting at Wonobobo Falls, I walked faster than the men, and got some two hundred yards in advance. As I rose the slope of an uneven piece of ground, I saw a large puma (*Felis concolor*) advancing along the other side of the rise towards me, with its nose down on the ground. The moment I saw it I stopped; and at the same instant it tossed up its head, and seeing me also came to a stand. With its body half crouched, its head erect, and its eyes round and black, from its pupils having expanded in the dusky light, it looked at once a noble and appalling sight. I glanced back along our wide path to see if any of my men were coming, as at the moment I felt that it was not well to be alone without some weapon of defence, and I knew that one of them had a gun; but nothing could I see. As long as I did not move the puma remained motionless also, and thus we stood some fifteen yards apart, eying each other curiously. I had heard that the human voice is potent in scaring most wild beasts, and feeling that the time had arrived to do something desperate, I waved my arms in the air and shouted loudly. The effect on the tiger was electrical; it turned quickly on

one side, and in two bounds was lost in the forest. I waited until my men came up, however, before passing the place at which it disappeared in case it might only be lying in ambush there; but we saw nothing more of it.

When returning down the portage and dragging our boats over, we saw a jaguar sitting on a log near the same spot, watching our movements with evident curiosity, and although the men were singing as they hauled the boats along, it did not seem to mind the noise. As soon as it saw that it was observed, it jumped off the log, and with a low growl made off. From this I infer that the flight of my puma must have been owing more to the windmill-like motion of my arms than to my voice.

During our journey across from the New River to the Essequebo, we were cooking breakfast one morning, when we heard a tremendous rushing and crashing noise coming towards us through the forest, and then caught a glimpse of an accourie flying for dear life before a black tiger. Just after they passed the accourie gave a heart-rending scream as the tiger seized it, but on my men rushing up to the spot, the tiger left its prey and fled. When picked up the accourie was quite dead, but on examination showed no marks whatever of the tiger's teeth. The tiger had evidently killed it by springing upon it with its legs close together, the weight of its body giving such a blow that the accourie's life was fairly knocked out. The men found its dead body just beyond a large log, slightly raised from the ground, under which it had bolted and lost some headway, while the cunning tiger took the log in its stride and so came, as it intended, on the poor accourie's back, with the result we have seen.

On returning to the head of the New River for provisions, we were followed for many miles by a tiger, for on going back we saw its huge tracks in the swampy places on our path.

With good hunting-dogs fine jaguar- and puma-hunting might be obtained on the banks of this river, where without doubt they are exceedingly numerous. Many of the Indian hunting-dogs trained for deer or tapir will hunt tigers. When on the track of either of these animals, should they come across the scent of a tiger, their eager and confident manner of pressing on after the game is immediately changed, and with hair on their backs erect they become cautious and nervous to a degree, jumping at even the snapping of a twig. Abandoning the hunt they take up the tiger's track and follow it. But should the huntsman call them from it, or not cheer them on with his voice from time to time, they exhibit great fear, and keeping close to his heels cannot be induced to hunt any more in that district for the day. On the contrary, if allowed to follow the tiger, they track it up with caution, being fully aware of the cunning dodge practised by that animal, which is, when the dog is close at hand, to spring to one side and lie in ambush till it passes, when with one spring the dog is seized.

Ordinary dogs would fall a prey to this trap, but not the self-taught tiger dogs. Their fine powers of scent warn them of their near approach to the quarry, when they advance with great caution, never failing to detect the tiger in time, and when once their eye is upon their enemy it has no chance to escape. In its pride of strength, the jaguar scorns the dogs, and with a rush like a ball from a cannon springs madly at one of them, feeling sure that it cannot escape. It has reckoned, however, without its host, for the dog eludes the spring with ease, and with great quickness flies on the tiger's flank, giving it a severe nip. As the tiger turns with a growl of pain and disappointment, the dog is off to a little distance, yelping lustily and never remaining still an instant, but darting first on one

side and then on the other. After one or two ineffectual charges the tiger gives it up, and on the approach of the hunter, springs into the nearest suitable tree, which it seldom leaves alive.

[The Indians describe several kinds of tigers and tiger-cats, each of which hunts one kind of animal in particular, whose call it can imitate. The deer-tiger is the puma. The wailah, or tapir-tiger, is pure black and of great size.]

The Corentyne and its branches were literally teeming with fish of various kinds, the greater number being haimara and perai. The latter were so abundant and ferocious that at times it was dangerous, when bathing, to go into the water at a greater depth than up to one's knees. Even then small bodies of these hungry creatures would swim in and make a dash close up to our legs, and then retreat to a short distance. They actually bit the steering paddles as they were drawn through the water astern of the boats. A tapir which I shot swimming across the river had its nose eaten off by them whilst we were towing it to the shore.

Of an evening the men used to catch some of them for sport, and in taking the hook from their mouths produce a wound from which the blood ran freely. On throwing them back into the water in this injured condition they were immediately set upon and devoured by their companions. Even as one was being hauled in on the line, its comrades, seeing that it was in difficulties, attacked it at once. One day, when the boat was hauled in to some rocks, a few of the men were engaged shooting fish near by, and in so doing wounded a large haimara. Having escaped from its human tormentors, it made for the open river, but was instantly attacked by perai attracted by the blood escaping from its wound, and was driven back to the shelter of the rocks close to the boat, from which I had a good

view of the chase. The large fish followed by its savage enemies reminded me of a parallel case on land,—a stricken deer pursued by wolves.

The perai, fortunately, lie only off sand-beaches and in quiet pools, not frequenting the cataracts, where their presence would be anything but acceptable to the men when working in the water. I was fortunate enough to find the spawning-place of some perai on the matted clusters of fibrous roots of some lianes, which hung from the branches of a tree into the water, among which much earthy sediment had collected and many small aquatic plants had grown. The sediment gave weight to the roots, which kept the clusters under water, and the force of the current made them buoyant, giving the lianes a slope when the river was high, which kept them not far from its surface. My attention was attracted to them by two perai lying close to them, with their heads up-stream, as the men said, engaged in watching their eggs. Procuring one of the roots I examined it, and found among it numbers of single eggs and clusters of small jelly-like young, which had been already hatched. The eggs were white and about one-eighth of an inch in diameter, with a hard exterior. The young were very little larger, and had a glutinous surface, which caused them to adhere together on being taken from the water. They had not acquired any powers of locomotion, but could just wriggle their tails like tadpoles. Under a lens they resembled the egg devoid of its covering, with a gelatinous ridge around three-quarters of its circumference, one of which expanded into a knob (probably the head), while the other termination was flattened and tail-like. I could not detect any eyes or mouth in them, but their bodies were speckled with gray markings of coloring matter. . . .

In hauling the boats up the shallow rapids near the

mouth of the Cutari the men, whilst wading, were frequently struck by conger eels. Every now and then a man would call out "Congler, congler," and jumping into the boat rub his shins, which had been benumbed by a touch from one of these fish. After half a minute or so the numbness wore off and he took to the water again. The boat being in a critical condition at the time, it was impossible for the men to leave the water. They had therefore to brave out the shocks from these batteries, which must have been very slight, given probably by small eels, or they could not have stood them.

Small long-bodied fish were very common, and one kind, called courami, took the baited hook as long as the fisherman who threw the line was out of sight.

The lukenaine, or sunfish, was captured by my men in a singular manner. They manufactured an exceedingly rude fly out of a bunch of silk-grass (*Bromelia karatas*) fibre, and attached it to a large hook with a short line and rod. Drawing it rapidly over pools among the rocks, it was immediately taken by the lukenaine, as the artificial fly is struck by the trout.

Sting-rays were frequently seen on the sandy bottom or grovelling for worms in the muddy banks under water. My interpreter, William, was unfortunate enough to step upon one, which, being of the color of the bottom, was not observed. It drove its spine or sting into the side of his instep, producing a jagged wound which bled profusely. I immediately put laudanum on the wound and gave him a strong dose of ammonia. In a quarter of an hour after he was writhing on the ground in great agony, actually screaming at times with the pain he felt in the wounded part, in his groin, and under one armpit. His foot and leg were so cold that he got one man to light a fire and support his foot over it, persisting in trying to put it in the

flames. I gave him two doses of laudanum, one shortly after the other, without relieving his sufferings in the slightest degree. After three hours of intense pain he became easier, but had returns of it at intervals during the night. For a week he was unable to put his foot on the ground, and the wound did not heal thoroughly for six weeks. . . .

We did not see a single cayman during our stay on the Corentyne. It may safely be inferred that there are none on that river, a singular fact that cannot be accounted for. Small alligators, of about four feet in length, are numerous, however, and one of them one night carried off a young cat which the men had brought from Georgetown. Poor puss had gone to the water's edge to drink, when the alligator with one blow of its tail swept it into the water and carried it away. On the following morning we saw the alligator with its snout resting on a rock near by, so I shot it; the men dragging it out of the water and leaving it on the rocks. On returning, some months afterwards, we camped at the same place, and there among the bones of the alligator saw those of the cat bleaching in the sun.

Iguanas were numerous, and on one occasion, when one in a tree overhead was shot at with an arrow, it jumped down to gain the water, but not calculating its distance accurately, landed on the back of one of the men, who, seeing it coming, ducked his head and dropped his paddle overboard. The paddle, being made of paruru, or paddle-wood, was heavy, and sank, and the man was afraid to dive for it among the numerous perai.

[The author proceeds to describe the birds and trees of the region, ending with an interesting account of the Brazil-nut.]

Upon the borders of the New River and main Corentyne, above the last-mentioned fall, we met with large

groves of Brazil-nut-trees, and on the ground beneath them obtained numbers of their nuts. I was fortunate to find some of the nut-cases containing nuts that had commenced to germinate, each nut sending out long roots from one end and young plants from the other. The roots were all twisted and matted together, quite filling up the cavities in the case around the nuts; yet the nut-case was hard and showed no signs of decay, so that it is difficult to say how the young plants free themselves. There is a small aperture where the fruit-stalk was once attached, but in only one instance did I find a case in which one of the young plants had found its way out through this and sent forth leaves. It seems to me that when this happens one plant alone survives of the twelve or fifteen that commenced to grow, and that its matted roots, gradually filling the nut-case, eventually burst it, when the plant is free to take root in the earth. The strong cover of the growing nut is a necessary protection to the young plant, for without such it would be devoured by one of the host of animals that are ready to eat it.

I planted some of the sprouting nuts, cut out of their hard outer covering, on my way up the river, but on returning found that they had all been dug up and eaten by rats and other small vermin. I therefore had a lot planted in a box at our camp above King Frederick William IV. Fall on my first return to that spot, and placed on the stem of a small tree cut off some five feet from the ground. In this position they were free from the attacks of small animals, and, being covered with a shelter of some palm-leaves, thrived wonderfully. These plants were subsequently sent to Kew, where they arrived in a fine healthy condition.

We found many nut-cases with holes cut in them by accouries, the marks of the gnawing teeth of those animals being plainly shown. My men used to open them by

chopping off their ends with a cutlass, which, owing to their hardness, was no easy operation. The quatas, or large black spider-monkeys, spent a good deal of their time in trying to open them by beating them against the branches of trees or on hard logs upon the ground; and as we passed a grove of Brazil-nut-trees it was amusing to hear the hammering sounds produced by these fellows at their self-imposed tasks. Where a single monkey was thus employed the blows were most laughably "few and far between," the creature showing its true indolent character by the slow way in which it performed its work, resting for a few minutes between every blow. It also showed an amount of perseverance, however, that one would not look for in a monkey, and a knowledge that it would eventually reap a reward for its hard labor.

Goodness knows how long it takes one of these monkeys to break a nut-case; but the time must be great, for on one occasion, during our journey from the New River to the upper Essequebo, we got quietly among a lot of the nut-breakers, and secured a nut-case which one in its hurry had left upon a log, and which was worn smooth by the friction of the monkey's hands. This had evidently been pounded for a length of time, but showed no signs of cracking. Its natural aperture was large enough to allow the monkey's fingers to touch the ends of the nuts inside, which were picked and worn by its nails. Near the same place we saw a nut-case split in two, on the flat surface of a large granite rock, that had evidently been broken by a monkey, for there were no Brazil-nut-trees, from which it could have fallen, overhanging the spot.

The blossoms of the Brazil-nut-tree are large and yellow, having a delicate aromatic perfume. They are similar, but larger than the caccarali, or monkey-pot-tree (*Lecythis ollaria*), whose flowers are so powerfully scented.

LIFE AND SCENERY IN VENEZUELA.

ALEXANDER VON HUMBOLDT.

[The illustrious traveller and scientist from whose picturesque descriptions of life and scenery in South America we here quote was born in Berlin, September 14, 1769. After a careful university education and scientific labors in Europe, he set sail for America in 1799, and during the succeeding five years explored a great extent of territory within the areas of the present states of Venezuela, Colombia, Ecuador, Peru, and Mexico. For twenty-five years succeeding his return he was employed in arranging his collections, publishing the results of his observations, and in other scientific labors. In 1829 he again became a traveller, and explored a wide district in Asia. He died, in his ninetieth year, May 6, 1859. Few men have ever done so much for the advancement of science, while his published works of travel contain much that is of value from a literary point of view. We extract a series of interesting passages relating to scenery and incidents in the Orinoco region. The first is descriptive of the remarkable "cow-tree."]

WHEN incisions are made in the trunk of this tree, it yields abundance of a glutinous milk, tolerably thick, devoid of all acridity, and of an agreeable and balmy smell. It was offered to us in the shell of a calabash. We drank considerable quantities of it in the evening before we went to bed, and very early in the morning, without feeling the least injurious effect. The glutinous character of this milk alone renders it a little disagreeable. The negroes and the free people who work in the plantations drink it, dipping into it their bread of maize or cassava. The overseer of the farm told us that the negroes grow sensibly fatter during the season when the *palo de vaca* furnishes them with most milk. The juice, exposed to the air, presents at its surface membranes of a strongly

animalized substance, yellowish, stringy, and resembling cheese.

Amidst the great number of curious phenomena which I have observed in the course of my travels, I confess there are few that have made so powerful an impression on me as the aspect of the cow-tree. Whatever relates to milk or to corn inspires an interest which is not merely that of the physical knowledge of things, but is connected with another order of ideas and sentiments. We can scarcely conceive how the human race could exist without farinaceous substances, and without that nourishing juice which the breast of the mother contains, and which is appropriated to the long feebleness of the infant. The amylaceous matter of corn, the object of religious veneration among so many nations, ancient and modern, is diffused in the seeds and deposited in the roots of vegetables; milk, which serves as an aliment, appears to us exclusively the produce of animal organization. Such are the impressions we have received in our earliest infancy; such is also the source of that astonishment created by the aspect of the tree just described. It is not here the solemn shades of forests, the majestic course of rivers, the mountains wrapped in eternal snow, that excite our emotion. A few drops of vegetable juice recall to our minds all the powerfulness and the fecundity of nature. On the barren flank of a rock grows a tree with coriaceous and dry leaves. Its large woody roots can scarcely penetrate into the stone. For several months of the year not a single shower moistens its foliage. Its branches appear dead and dried; but when the trunk is pierced there flows from it a sweet and nourishing milk. It is at the rising of the sun that this vegetable fountain is most abundant. The negroes and natives are then seen hastening from all quarters, furnished with large bowls to receive the milk, which grows yellow and thickens at its

[illegible] substance, [illegible], stringy, and resembling [illegible].

[illegible] the great number of curious phenomena which I have observed in the course of my travels, I confess there are few that have [illegible] on me as the aspect of the [illegible]. [illegible] to milk or to corn [illegible] that of the physical [illegible] of [illegible] with another order of [illegible]. We [illegible] conceive how the human race could [illegible] without [illegible] substances, and without that [illegible] juice which the breast of the mother contains, and which is appropriated to the long [illegible] of the infant. The amylaceous matter of corn, the object of religious veneration among so many nations, ancient and modern, is diffused in the [illegible] and [illegible] in the roots of vegetables; milk, which [illegible] to be [illegible] to be [illegible], the product of animal [illegible] we have [illegible] in our [illegible] [illegible] the source of that astonishment [illegible] the [illegible] described. It is not [illegible] the [illegible] of [illegible], the [illegible] of [illegible], the mountains wrapped in eternal [illegible] that [illegible] our [illegible]. A few drops of vegetable [illegible] in the [illegible] of the powerfulness and the [illegible] of [illegible]. On the [illegible] of a cook grows a [illegible] [illegible]. Its large woody [illegible] the [illegible] [illegible] the [illegible]. For several months of the [illegible] [illegible] [illegible] its [illegible]. Its [illegible] [illegible] [illegible], but when the [illegible] is [illegible] [illegible] [illegible] and nourishing milk. It is at the rising of the sun that this vegetable [illegible] is most abundant. The [illegible] and [illegible] are then seen [illegible] from all quarters, furnished with large bowls to receive the milk, which grows yellow and [illegible] at its

LA GUAYRA, VENEZUELA

surface. Some empty their bowls under the tree itself, others carry the juice home to their children.

[The great plains of Venezuela are thus described:]

The sun was almost at its zenith; the earth, wherever it appeared sterile and destitute of vegetation, was at the temperature of 120°. Not a breath of air was felt at the height at which we were on our mules; yet, in the midst of this apparent calm, whirls of dust incessantly arose, driven on by those small currents of air which glide only over the surface of the ground, and are occasioned by the difference of temperature between the naked sand and the spots covered with grass. All around us the plains seemed to ascend to the sky, and the vast and profound solitude appeared like an ocean covered with sea-weed. On the horizon the earth was confounded with the sky. Through the dry mist and strata of vapor the trunks of palm-trees were seen from afar, stripped of their foliage and their verdant summits, and looking like the masts of a ship descried upon the horizon. There is something awful, as well as sad and gloomy, in the uniform aspect of these steppes. Everything seems motionless; scarcely does a small cloud, passing across the zenith, and denoting the approach of the rainy season, cast its shadow on the earth. I know not whether the first aspect of the llanos excites less astonishment than that of the chain of the Andes.

When, beneath the vertical rays of the bright and cloudless sun of the tropics, the parched sward crumbles into dust, then the indurated soil cracks and bursts as if rent asunder by some mighty earthquake. And if, at such a time, two opposite currents of air, by conflict moving in rapid gyrations, come in contact with the earth, a singular spectacle presents itself. Like funnel-shaped clouds, their apexes touching the earth, the sand rises in vapory form

through the rarefied air in the electrically-charged centre of the whirling current, sweeping on like the rushing water-spout, which strikes such terror into the heart of the mariner. A dim and sallow light gleams from the lowering sky over the dreary plain. The horizon suddenly contracts, and the heart of the traveller sinks with dismay as the wide steppe seems to close upon him on all sides. The hot and dusty earth forms a cloudy veil which shrouds the heavens from view, and increases the stifling oppression of the atmosphere, while the east wind, when it blows over the long-heated soil, instead of cooling, adds to the burning glow. Gradually, too, the pools of water, which had been protected from evaporation by the now seared foliage of the fan-palm, disappear. As in the icy north animals become torpid from cold, so here the crocodile and the boa-constrictor lie wrapt in unbroken sleep, deeply buried in the dried soil. Everywhere the drought announces death, yet everywhere the thirsty wanderer is deluded by the phantom of a moving, undulating, watery surface, created by the deceptive play of the mirage. A narrow stratum separates the ground from the distant palm-trees, which seem to hover aloft, owing to the contact of currents of air having different degrees of heat, and therefore of density. Shrouded in dark clouds of dust, and tortured by hunger and burning thirst, oxen and horses scour the plain, the one bellowing dismally, the other with out-stretched necks snuffing the wind, in the endeavor to detect, by the moisture of the air, the vicinity of some pool of water not yet wholly evaporated.

The mule, more cautious and cunning, adopts another method of allaying his thirst. There is a globular and articulated plant, the *Melo-cactus*, which encloses under its prickly integument an aqueous pulp. After carefully striking away the prickles with its forefeet, the mule

cautiously ventures to apply his lips to imbibe the cooling thistle juice. But the draught from this living vegetable spring is not always unattended by danger, and these animals are often observed to have been lamed by the puncture of the cactus thorn. Even if the burning heat of day be succeeded by the cool freshness of the night, here always of equal length, the wearied ox and horse enjoy no repose. Huge bats now attack the animals during sleep, and vampire-like suck their blood; or, fastening on their backs, raise festering wounds, in which mosquitoes, hippobosces, and a host of other stinging insects burrow and nestle.

When, after a long drought, the genial season of rain arrives, the scene suddenly changes. The deep azure of the hitherto cloudless sky assumes a lighter hue. Scarcely can the dark space in the constellation of the Southern Cross be distinguished at night. The mild phosphorescence of the Magellanic clouds fades away. Like some distant mountain, a single cloud is seen rising perpendicularly on the southern horizon. Misty vapors collect and gradually overspread the heavens, while distant thunder proclaims the approach of the vivifying rain. Scarcely is the surface of the earth moistened before the teeming steppe becomes covered with a variety of grasses. Excited by the power of light, the herbaceous mimosa unfolds its dormant, drooping leaves, hailing, as it were, the rising sun in chorus with the matin song of the birds and the opening flowers of aquatic plants. Horses and oxen, buoyant with life and enjoyment, roam over and crop the plains. The luxuriant grass hides the beautifully spotted jaguar, who, lurking in safe concealment, and carefully measuring the extent of his leap, darts, like the Asiatic tiger, with a cat-like bound upon his passing prey. At times, according to the accounts of the natives, the humid clay on the banks of the morasses

is seen to rise slowly in broad flakes. Accompanied with a violent noise, as on the eruption of a small mud-volcano, the upheaved earth is hurled high into the air. Those who are familiar with the phenomenon fly from it; for a colossal water-snake, or a mailed and scaly crocodile, awakened from its trance by the first fall of rain, is about to burst from its tomb.

When the rivers bounding the plain to the south, as the Arauca, the Apure, and the Payara, gradually overflow their banks, nature compels those creatures to live as amphibious animals, which, during the first half of the year, were perishing with thirst on the waterless and dusty plain. A part of the steppe now presents the appearance of a vast inland sea. The mares retreat with their foals to the higher banks, which project, like islands, above the spreading waters. Day by day the dry surface diminishes in extent. The cattle, crowded together, and deprived of pasturage, swim for hours about the inundated plain, seeking a scanty nourishment from the flowing panicles of the grasses which rise above the lurid and bubbling waters. Many foals are drowned, many are seized by crocodiles, crushed by their serrated tails, and devoured. Horses and oxen may not unfrequently be seen which have escaped from the fury of this blood-thirsty and gigantic lizard, bearing on their legs the marks of its pointed teeth.

[A widely different scene is that of the forest region, the nocturnal noises of whose animal inhabitants are thus picturesquely described.]

Below the mission of Santa Barbara de Arichuna we passed the night as usual in the open air, on a sandy flat, on the bank of the Apure, skirted by the impenetrable forest. We had some difficulty in finding dry wood to kindle the fires with which it is here customary to surround the bivouac, as a safeguard against the attacks of the

jaguar. The air was bland and soft and the moon shone brightly. Several crocodiles approached the bank; and I have observed that fire attracts these creatures as it does our crabs and many other aquatic animals. The oars of our boats were fixed upright in the ground, to support our hammocks. Deep stillness prevailed, only broken at intervals by the blowing of the fresh-water dolphins, which are peculiar to the river net-work of the Orinoco.

After eleven o'clock such a noise began in the contiguous forest, that for the remainder of the night all sleep was impossible. The wild cries of animals rung through the woods. Among the many voices which resounded together, the Indians could only recognize those which, after short pauses, were heard singly. There was the monotonous, plaintive cry of the howling monkeys, the whining, flute-like notes of the small sapajous, the grunting murmur of the striped nocturnal ape, the fitful roar of the great tiger, the cougar, or maneless American lion, the peccary, the sloth, and a host of parrots, parraquas, and other pheasant-like birds. Whenever the tigers approached the edge of the forest, our dog, who before had barked incessantly, came howling to seek protection under the hammocks. Sometimes the cry of the tiger resounded from the branches of a tree, and was always then accompanied by the plaintive, piping tones of the apes, who were endeavoring to escape from the unwonted pursuit.

If one asks the Indians why such a continuous noise is heard on certain nights, they answer, with a smile, that "the animals are rejoicing in the beautiful moonlight, and celebrating the return of the full moon." To me the scene appeared rather to be owing to an accidental, long-continued, and gradually increasing conflict among the animals. Thus, for instance, the jaguar will pursue the peccaries and the tapirs, which, densely crowded together, burst

through the barrier of tree-like shrubs which opposes their flight. Terrified at the confusion, the monkeys on the tops of the trees join their cries with those of the larger animals. This arouses the tribes of birds who build their nests in communities, and suddenly the whole animal world is in a state of commotion. Further experience taught us that it was by no means always the festival of moonlight that disturbed the stillness of the forest; for we observed that the voices were loudest during violent storms of rain, or when the thunder echoed and the lightning flashed through the depths of the wood. The good-natured Franciscan monk who accompanied us through the cataracts of Apures and Maypures to San Carlos, on the Rio Negro, and to the Brazilian frontier, used to say, when apprehensive of a storm at night, "May heaven grant a quiet night both to us and to the wild beasts of the forest!"

[The unpleasant conditions of a canoe voyage on the Orinoco are thus described:]

The new canoe intended for us was, like all Indian boats, a trunk of a tree hollowed out partly by the hatchet and partly by fire. It was forty feet long and three broad. Three persons could not sit in it side by side. These canoes are so crank, and they require, from their instability, a cargo so equally distributed, that when you want to rise for an instant, you must warn the rowers to lean to the opposite side. Without this precaution the water would necessarily enter the side pressed down. It is difficult to form an idea of the inconveniences that are suffered in such wretched vessels. To gain something in breadth, a sort of lattice-work had been constructed on the stern with branches of trees, that extended on each side beyond the gunwale. Unfortunately, the *toldo*, or roof of leaves, that

covered this lattice-work, was so low that we were obliged to lie down, without seeing anything, or, if seated, to sit nearly double. The necessity of carrying the canoe across the rapids, and even from one river to another, and the fear of giving too much hold to the wind, by making the toldo higher, render this construction necessary for vessels that go up towards the Rio Negro. The toldo was intended to cover four persons, lying on the deck or lattice-work of brush-wood; but our legs reached far beyond it, and when it rained half our bodies were wet. Our couches consisted of ox-hides or tiger-skins spread upon branches of trees, which were painfully felt through so thin a covering. The fore part of the boat was filled with Indian rowers, furnished with paddles, three feet long, in the form of spoons. They were all naked, seated two by two, and they kept time in rowing with a surprising uniformity, singing songs of a sad and monotonous character. The small cages containing our birds and our monkeys—the number of which augmented as we advanced—were hung some to the toldo and others to the bow of the boat. This was our travelling menagerie. Every night, when we established our watch, our collection of animals and our instruments occupied the centre; around these were placed, first, our hammocks, then the hammocks of the Indians; and on the outside were the fires, which are thought indispensable against the attacks of the jaguar. About sunrise the monkeys in our cages answered the cries of the monkeys of the forest.

In a canoe not three feet wide, and so encumbered, there remained no other place for the dried plants, trunks, sextant, a dipping needle, and the meteorological instruments, than the space below the lattice-work of branches, on which we were compelled to remain stretched the greater part of the day. If we wished to take the least object out of a trunk, or to use an instrument, it was necessary to

row ashore and land. To these inconveniences were joined the torment of the mosquitoes which swarmed under the toldo, and the heat radiated from the leaves of the palm-trees, the upper surface of which was continually exposed to the solar rays. We attempted every instant, but always without success, to amend our situation. While one of us hid himself under a sheet to ward off the insects, the other insisted on having green wood lighted beneath the toldo, in the hope of driving away the mosquitoes by the smoke. The painful sensations of the eyes, and the increase of heat, already stifling, rendered both these contrivances alike impracticable. With some gayety of temper, with feelings of mutual good-will, and with a vivid taste for the majestic grandeur of these vast valleys of rivers, travellers easily support evils that become habitual.

[The torment of insects—mosquitoes and venomous flies by day, and the *zancudos* (large gnats) by night—became almost insupportable as they advanced. On the upper Orinoco the mosquitoes form the principal topic of conversation, the usual salutation being, "How did you find the gnats during the night?" or, "How are you off for mosquitoes to-day?" Humboldt thus describes the situation:]

The lower strata of air, from the surface of the ground to the height of fifteen or twenty feet, are absolutely filled with venomous insects. If in an obscure spot, for instance, in the grottos of the cataracts formed by superincumbent blocks of granite, you direct your eyes towards the opening enlightened by the sun, you see clouds of mosquitoes more or less thick. I doubt whether there be a country upon earth where man is exposed to more cruel torments in the rainy season. Having passed the fifth degree of latitude you are somewhat less stung; but on the upper Orinoco the stings are more painful, because the heat and the absolute want of wind render the air more burning and more irritating in its contact with the skin. "How com-

fortable people must be in the moon!" said a Salive Indian to Father Gumilla. "She looks so beautiful and so clear, that she must be free from mosquitoes." These words, which denote the infancy of a people, are very remarkable. The satellite of the earth appears to all savage nations the abode of the blessed, the country of abundance. The Esquimaux, who counts among his riches a plank or the trunk of a tree, thrown by the currents on a coast destitute of vegetation, sees in the moon plains covered with forests; the Indian of the forest of Orinoco there beholds open savannas, where the inhabitants are never stung by mosquitoes.

[The story of the voyage closes as follows:]

It would be difficult for me to express the satisfaction we felt on landing at Angostura [the capital of Spanish Guiana.] The inconveniences endured at sea in small vessels are trivial in comparison with those that are suffered under a burning sky, surrounded by swarms of mosquitoes, and lying stretched in a canoe, without the possibility of taking the least bodily exercise. In seventy-five days we had performed a passage of five hundred leagues —twenty to a degree—on the five great rivers, Apure, Orinoco, Atabapo, Rio Negro, and Cassiquiare; and in this vast extent we had found but a very small number of inhabited places. Coming from an almost desert country, we were struck with the bustle of the town, though it contained only six thousand inhabitants. We admired the conveniences which industry and commerce furnish to civilized man. Humble dwellings appeared to us magnificent; and every person with whom we conversed seemed to be endowed with superior intelligence. Long privations give a value to the smallest enjoyments; and I cannot express the pleasure we felt when we saw for the first time wheaten bread on the governor's table.

THE LLANEROS OF VENEZUELA.

RAMON PAEZ.

[Don Ramon Paez, in his "Wild Scenes in South America; or, Life in the Llanos of Venezuela," has given us some interesting pictures of a region little known to travellers. These vast plains are inhabited by a people many of whom bear a close resemblance in their habits to the Argentine Gauchos. The following selection is devoted to a description of this people and their region of habitation.]

WE left Ortiz as usual, very early the next morning, stumbling here and there amidst the mass of loose stones which paved the way along the winding bed of the *quebrada.* In proportion as we advanced on our route the hills decreased in size, while the loose stones seemed to increase in quantity. The splendid groves of hardy and balsamiferous trees, which near Ortiz formed an almost impenetrable forest, gradually became less imposing in appearance, until they were replaced by thickets of thorny bushes, chiefly composed of several species of mimosas, with a delicate and feathery foliage. The traveller accustomed to the shade of a luxuriant vegetation, and to the sight of cultivated valleys, is struck by the rapid diminution of the former, and the total disappearance of the latter, as he emerges from the Galeras of Ortiz; yet he is somewhat compensated by the almost overpowering perfume shed by masses of the canary-colored blossoms with which these shrubs are loaded, from the summits down to the bending branches that trail the ground at every passing breeze.

Suddenly we entered a widely-extended tract of level land almost destitute of vegetation. With the exception of a few clumps of palm-trees with fan-like leaves, nothing

but short grass covered its entire surface, almost realizing the idea of an "ocean covered with sea-weed." A dense mass of vapor pervading the atmosphere obscured the horizon, while the fan-palms, seen from afar, appeared like ships enveloped in a fog. Gradually the circle of the heavens seemed to close around us, until we became, as it were, encompassed by the sky. We were, in fact, treading the shores of the great basin of the Llanos, over one of the ancient shoals or *mesas*, which, like successive terraces, now form the border of those grassy oceans known as the Pampas. This was the Mesa de Paya, the seat of one of the cattle-farms to which we were bound.

After wandering for nearly three hours over this monotonous landscape without compass, and guided only by certain landmarks known to the *vaqueanos*, we came unexpectedly upon the borders of the Mesa, which commands an extensive view of the lower savannas. As if by magic, the dreary scene changed to one of the most glorious panoramas in existence. At our feet lay a beautiful expanse of meadow, fresh and smooth as the best cultivated lawn, with troops of horses and countless herds of cattle dispersed all over the plain. Several glittering ponds, alive with all varieties of aquatic birds, reflected upon their limpid surface the broad-leaved crowns of the fan-palms, towering above verdant groves of laurel, amyris, and elm-like *robles*. Farther beyond, and as far as the eye could reach, the undulating plain appeared like a petrified ocean after the sweeping tempest.

But I feel that my descriptions fall short of the reality, and that I am unable to depict the harmonious effects of light and shade, and the blending of the various tints of green, blue, and purple, dispersed over this extensive panorama; the towering palms gracefully fanning the glowing atmosphere with their majestic crowns of broad and

shining leaves, and myriad other beauties difficult to enumerate.

I could scarcely tear myself away from the spot, so fascinated was I with the novelty of the scene. My companions, more concerned for the speedy termination of the journey than the beautiful in nature, set off at a brisk trot towards the house, which was at no great distance. Fearing to lose my way among the intricate paths leading to it, I was compelled to follow in their wake, stopping occasionally to gaze once more upon those enchanting groves, which seemed to return me to the highly cultivated fields and green meadows of glorious "Old England," from whence I had just returned.

On descending to the plain below, my attention was attracted to an unsightly group of palm-thatched huts, looking more like huge beehives than the abode of human beings. A formidable fence of palm-trunks surrounded the premises and several acres of ground beyond. These were the *corrals*, or enclosures where the training of the fierce herds was practised by the hardy dwellers of the Llanos; but no signs of cultivation, or aught else connected with the rural occupations of the farmer, were visible in the neighborhood. Presently the cavalcade stopped before the gate, and all the individuals composing it dismounted and began to unsaddle their horses, amidst the barking of a legion of dogs and the braying of all the donkeys in the vicinity.

This was the *hato*, or cattle-farm, of San Pablo we were in quest of, famous in the annals of the civil wars in Venezuela as the occasional head-quarters of the constitutional armies, commanded by the owner of this farm. Our leader was received at the entrance of his estate by a grave and elderly negro slave, who acted as overseer, and had under his control all the men and property attached to it.

Kneeling upon the stony court-yard, he kissed the hand extended to him in friendly greeting, after which he proceeded to unsaddle his master's horse, which he led to a pond within the enclosure, where the horses were watered.

We purposed remaining a few days at San Pablo, with the object of incorporating some fresh relays of mules and horses from the abundant stock of this estate; so we of the staff installed ourselves under the palm-roof of our rustic mansion, while the rank and file of the expedition found accommodation in the open barracoons adjoining it, although none of the party had reason to boast of being better off than his neighbor.

"It is sad when pleasing first impressions are obliterated," remarks a sentimental writer; "always painful to become *désenchanté* on a more intimate acquaintance with either people or places." I soon found that I was not in the fairy-land I had imagined, abounding in grottos and refreshed by sparkling fountains, but in the region of the Llanos, where the French adage, *Chacun pour soi et Dieu pour tous*, is verified to its fullest extent. San Pablo, with its vaunted prestige, and in spite of its proximity to several important marts, was no better-provided with accommodations than the untidy *douar* of the wandering Arab of the desert. A rickety table standing against the wall for fear of tumbling down, two or three clumsy cedar chairs covered with raw hide, and a couple of grass hammocks, serving the double purpose of beds and lounges, constituted all the furniture of the great farm. As a substitute for wardrobes and hat-stands, we were shown a number of deer-antlers and bull-horns embedded in the walls of reeds and mud, on which to hang our pouches, bridles, etc.

I searched in vain on our arrival for something like a bowl in which to lave my hands and face, covered with dust and parched by the broiling sun of the savannas.

Even water was so scarce that it was served to us sparingly from a large calabash gourd used in bringing it from the river, nearly a mile distant. It is true there was, within the enclosure of the houses, a pond or excavation, made while searching for the remains of a brave officer who fell fighting for his country's freedom. Sufficient water had accumulated there during the rainy season to entitle it to the name of *Laguna* or Lake of Genaro Vazquez, the name of the aforementioned hero; but it was so filled with *bavas*, —a small species of alligator,—terrapins, and toads, as to render the water undrinkable.

But to return to our head-quarters, the structure of which struck me so forcibly at first as a beehive of vast proportions, naturally suggesting the idea of a "land of milk and honey." Unfortunately, neither of these could be obtained for love or money, although the woods and pastures of the estate abounded in both the creatures that produced them. So we were compelled to resort to our reserved stock of *papelon* to sweeten our coffee, and to its own delicious natural aroma in the place of milk. As to the house itself, it only differed from the rest in that region in being larger, and perhaps in better order, than are the generality. Imagine a pyramidal structure, thatched with palm-leaves, the roof slanting to within a few feet of the ground, and supported on stout posts of live timber, which served also as framework for the walls, and you will have some idea of the style of architecture peculiar to the country. Doors and windows are of no account in a country uniformly warm throughout the year, and where the inhabitants possess few articles capable of tempting the cupidity of light-fingered gentry. Therefore an ox-hide stretched across the openings left in the walls to admit light and the inmates is all that is required to keep off uninvited guests. As an exception to this rule, our mansion of San Pablo had one or two rooms

set apart for invalids, provided with doors and windows of solid planks of timber in the rough; the other apartments had the upper half of the walls purposely left open, to admit full and free entrance of light and air. A narrow piazza or corridor, formed by the slanting of the roof to within five feet of the ground, ran along the entire length of the main building, and was intended more as a protection to the rooms against the sun and rains than as a resort for the inmates.

The first step, on arriving, was to secure a place in the open reception-room for my own chattels and hammock, before all the spare posts and hooks had been appropriated by my companions. This accomplished, I proceeded to a thorough examination of my saddle and its accoutrements, so as to have them adapted to the peculiar mode of travelling in the Llanos. This care I left to the good judgment of our attendants, not being myself sufficiently skilled in the art of mending, greasing, and putting in order the complicated gear of our riding equipment. In the same predicament were also my two English companions, and our worthy doctor; a kind word, however, addressed to the good-natured Llaneros—especially if accompanied with a drop of aguardiente—never failed of enlisting their services in our favor.

Habit, as well as necessity, is sometimes the mother of invention, as my experience soon taught me that, to get along in my new quarters, it would be requisite to set aside the airs and insignia of civilization. Divesting myself, therefore, of all such superfluities as coat, cravat, pants, and shoes, I adopted the less cumbrous attire of the Llaneros, consisting mainly of breeches tightly buttoned at the knee, and a loose shirt, usually of a bright checkered pattern. Shoes are altogether dispensed with in a country like the Llanos, subject to drenching rains, and covered

with mud during a great portion of the year, besides the inconvenience they offer to the rider in holding the stirrup securely when in chase of wild animals. The leg, however, is well protected from the thorns and cutting grass of the savannas by a neat legging or *botin*, made of buff-skin, tightly buttoned down the calf by knobs or studs of highly polished silver. Another characteristic article of dress, and one in which the wearers take great pride, is the linen checkered handkerchief loosely worn around the head. Its object is ostensibly to protect it from the intensity of the sun's rays; but the constant habit of wearing it has rendered the handkerchief as indispensable a head-dress to the Llaneros as is the cravat to the neck of the city gentleman.

[The traveller proceeds with further details of the life of these people, and with an account of their half-savage method of slaughtering their cattle; which we can well omit for a more general descriptive passage.]

The people inhabiting the vast region of the Llanos, although claiming descent from the old Castilian race, once the rulers of the land, are, in fact, an amalgamation of the various castes composing the present population of the republic. These are the whites, or the descendants of the European settlers of the country; the aboriginals or Indians, and a great portion of blacks. In most of the towns the native whites preponderate over all others, and represent the wealth as well as the most respectable portion of the community; in the villages and thinly populated districts of the plains a mongrel breed, resulting from the admixture of these three, constitute the majority of the inhabitants. These are dispersed over an area of twenty-seven thousand square miles, making a proportion of only fourteen individuals, out of a population of three hundred and ninety thousand, to every square mile.

This race, although vastly inferior to the first in mental capacity and moral worth, is endowed with a physique admirably adapted to endure the fatigues of a life beset with dangers and hardships. Cast upon a wild and apparently interminable plain, the domain of savage beasts and poisonous reptiles, their lot has been to pass all their life in a perpetual struggle, not only with the primitive possessors of the land, but with the elements themselves, often as fierce as they are grand. When it is not the alarm of the dreaded viper or the spotted jaguar, it is the sudden inroad of vast inundations, which, spreading with fearful rapidity over the land, sweep off in one moment their frail habitations and their herds. Nevertheless this insecure existence, this continual struggle between life and death, between rude intellect and matter, has for the Llanero a sort of fascination, perhaps not so well understood by people possessing the blessings and ideas of civilization, but without which he could not exist, especially if deprived of his horse and cast among the mountain region north of his cherished plains.

The modern Centaur of the desolate regions of the New World, the Llanero spends his life on horseback; all his actions and exertions must be assisted by his horse; for him the noblest effort of man is when, gliding swiftly over the boundless plain and bending over his spirited charger, he overturns an enemy or masters a wild bull. The following lines of Victor Hugo seem as though copied from this model: "He would not fight but on horseback; he forms but one person with his horse; he lives on horseback; trades, buys, and sells on horseback; eats, drinks, sleeps, and dreams on horseback." Like the Arab he considers his horse his best and most reliable friend on earth, often depriving himself of rest and comfort after a hard day's journey to afford his faithful companion abundance of food and water.

Few people in the world are better riders than the Llaneros of Venezuela, if we except perhaps the Gauchos of Buenos Ayres, or equal to either in the dexterity they display in the wonderful feats of horsemanship to which their occupations in the field inure them from childhood. Their horses, moreover, are so well trained to the various evolutions of their profession, that animal and rider seem to possess but one existence.

The life of the Llanero, like that of the Gaucho his prototype, is singularly interesting, and resembles in many respects that of others who, like them, have their abode in the midst of extensive plains. Thus they have been aptly styled the Cossacks and the Arabs of the New World, with both of whom they have many points in common, but more especially do they resemble the last named. When visiting the famous Constantine Gallery of paintings at Versailles, I was struck with the resemblance of the Algerine heroes of Horace Vernet to our own, revealing at once the Moorish descent of the latter, independently of other characteristic peculiarities.

[Sir Francis Head, in his "Journeys across the Pampas," gives the following description of the infancy of a closely similar race.]

"Born in the rude hut, the infant Gaucho receives little attention, but is left to swing from the roof in a bullock's hide, the corners of which are drawn towards each other by four strips of hide. In the first year of his life he crawls about without clothes, and I have more than once seen a mother give a child of this age a sharp knife, a foot long, to play with. As soon as he walks, his infantine amusements are those which prepare him for the occupations of his future life; with a lazo made of twine he tries to catch little birds, or the dogs, as they walk in and out of the hut. By the time he is four years old he is on

horseback, and immediately becomes useful by assisting to drive the cattle into the corral."

When sufficiently strong to cope with a wild animal, the young Llanero is taken to the *majada* or great cattle-pen, and there hoisted upon the bare back of a fierce young bull. With his face turned towards the animal's tail, which he holds in lieu of bridle, and his little legs twisted round the neck of his antagonist, he is whirled round and round at a furious rate. His position, as may be imagined, is anything but equestrian; yet, the fear of coming in contact with the bull's horns compels the rider to hold on until, by a dexterous twist of the animal's tail while he jumps off its back, he succeeds in overturning his antagonist.

In proportion as he grows older and stronger, a more manly amusement is afforded him with the breaking in of a wild colt. This being, however, a more dangerous experiment, in which many a young eagle "is rendered a lame duck," he is provided with the necessary accoutrements to withstand the terrible struggle with the animal. Firmly seated upon his back and brandishing overhead a *chaparro* vine for a whip, the apprentice is thus installed in his new office, from which he must not descend until the brute is perfectly subdued; the coil of lazo in the hands of his merciless instructor would be the least evil awaiting him should he otherwise escape safe and sound from the desperate kicks and plunges of the horse.

Here commences what we may term the public life of the Llanero; his education is now considered complete. From this moment all his endeavors and ambition will be to rival his companions in the display of physical force, which he shows to an admirable degree when, armed with his tough lazo, he pursues the wild animals of his domain. If a powerful bull or wild horse tries to escape into the open plain, the cavalier unfurls the noose which is always

ready by his side, and the fugitive is quickly brought back to the corral. Should the thong give way under the impetuous flight of the animal, the rider seizes him by the tail, and whirling round suddenly, pulls towards him with so much force as to cause his immediate overthrow.

In all these exercises the roving cavalier of the Llanos acquires that feeling of security and enduring disposition for which he is famous. Unfortunately, it is often turned to account in disturbing the balance of power among his more enlightened countrymen; for he is always ready to join the first revolutionary movement offering him the best chance for equipping himself with arms of all descriptions. Next to the horse, the Llanero esteems those weapons which give him a superiority over his fellow-creatures,—viz., a lance, a blunderbuss, and a fine sword. If he is unprovided with either of these, he considers himself a miserable and degraded being, and all his efforts will tend to gratify this favorite vanity even at the risk of his own life. Therefore he goes to war, because he is sure, if victorious, of finding the battle-field covered with these tempting trophies of his ambition. In this, unfortunately, he is too often encouraged by a host of unprincipled politicians, who, not wishing to earn a livelihood by fair means, are eternally plotting against the powers that be.

THE FORESTS OF THE AMAZON AND MADEIRA RIVERS.

FRANZ KELLER.

[The author of the following selection, with his father, was sent in 1867, by the Minister of Public Works at Rio Janeiro, to explore the Madeira, and to project a railroad along its banks where the rapids rendered navigation impossible. His observations during this journey are given in "The Amazon and Madeira Rivers," from which we extract his remarks concerning the Brazilian forests.]

EVERYWHERE the decomposing organisms serve as bases for new formations. No particle, however small, is ever lost in the great household of Nature; but nowhere is her restless activity so conspicuous as in the tropics, where the succession of vegetable decay and life is so much more rapid than it is in colder climes; and which will strike the reflecting student more especially in the wide, forest-clad valleys of tropical America, and on the Amazon and its affluents.

On the heights of the Cordillera the process is already at work. The waste of the mountain-slopes, broken off by rills and torrents, and carried by them into the main river, slowly drifts down-stream in the form of gravel-banks, until, scattered and rent asunder in a thousand ways, it finally takes permanent form as light-green islands, which are soon covered and protected with a dense coat of vegetation.

As every zone of geologic formation in the extensive valley adds its tribute, these banks are a kind of mineralogical collection, which shows samples of all the rocks on the river-banks, with the exception, perhaps, of light pumice-stone, the produce of the volcanoes of the Andes, which drifts down-stream in large pieces, and is highly prized by the Tapuia population (on the lower course) for sharpening and cleaning their weapons and tools. Even when not picked up by hunter or fisher, it is not lost. It will be arrested by some snag or projection of the shore, it will so get embedded in the newly-forming sediment, and thousands of years hence its silicic acid will afford the necessary material for the hard glassy bark of a bambusacea, or the sharp edge of a reed. When the currents are not strong enough to move the larger banks, they at least carry sand and earth with them, and deposit them as shoals or new alluvion at less exposed spots. . . .

The undermined concave shores are sometimes a serious danger to the passing barque, as even the slight ripple of a canoe is sufficient to bring down the loosely overhanging earth, often covered with gigantic trunks. These concave sides, with their fallen trees and their clusters of sinking javary-palms, supported sometimes by only a tangled network of tough lianas, give to the scenery that peculiar character of primeval wildness which is so charming to foreigners.

When one has climbed up the steep shore, often forming huge terrace-like elevations, and has safely passed through a labyrinth of interwoven roots and creepers into the interior of the forest, which is getting freer from underwood at some distance from the river, he is oppressed with the sensation of awe and wonder felt by man on entering one of the venerable edifices of antiquity.

A mysterious twilight encompasses us, which serves to intensify the radiance of the occasional sunbeam as it falls on a glossy palm-leaf, or on a large bunch of purple orchid-flowers. Splendid trunks, some of them from twenty to thirty feet in diameter, rise like so many pillars supporting the dense green vault of foliage; and every variety of tall, graceful palms, spare and bushy, and bearing heavy berries of bright yellow or red, struggle to catch a glimpse of the light, from which they are shut out by the neighboring giants, of which the figueira (or wild fig-tree) is one of the most striking, in the dimensions of its crown and stem, and in the strange shape of its roots, which project like huge outworks. These seem to grow in all directions, forming props, stays, and cross-bars wherever they are wanted, just as if the whole were a soft plastic mass, the sole purpose of which was to supply, with a minimum of material, as much stability as possible to the trunk, whose wood is of extreme softness and whose roots are not deep.

The pachiuba-palm (*Iriartea exorhiza*) and some species of Cecropiæ exhibit other extravagances in their roots. They appear as if standing on stilts, the real trunks only beginning at eight or ten feet above ground.

But, more than all, it is the profusion of orchids and Bromeliæ that excites our admiration. These bright children of the tropics envelop with dense foliage as well the fallen and mouldering trunks as those yet upstanding in full vigor and bloom, thus forming hanging gardens of astounding magnificence, which reveal leaves and flowers of the most irregular shapes and colors. Everywhere, on the branches and on the ground, and even from out the fissures of the bare rock, light ferns and rich moss spring up and clothe the decaying trunks with fresh green. Of mosses and ferns, especially tree-ferns, we found a greater exuberance and a larger variety, in species as well as in individuals, in the Southern provinces of the empire, São Paulo and Paraná; but for splendid palms and gigantic dicotyledons the North is decidedly the richer of the two.

Without the aid of the pencil it is indeed scarcely possible to give an adequate idea of the magnificence of this vegetation, especially of the manner in which the different forms are grouped. We may see, it is true, in our own hot-houses, well-trimmed palms, beautiful orchids with their abnormal blossoms, and Aroideæ with their bright, sappy, sometimes regularly perforated, leaves; but how different is this from the virgin forest, wherein Nature, undisturbed by man, has created her own prodigies, and where no narrow pots separate her children from the maternal soil, and where no dim roof of glass intervenes between them and the blue ether! Nor, in our carefully tended hot-houses, is the eye ever gratified with such agreeable contrasts as are afforded by the silver-gray and rust-brown tints of the decayed leaf of the palm or the fern-tree, or

the black bark of the rotting trunk, with the blazing scarlet of some heliconia blossom. How difficult it must be to give to every plant, especially to orchids, the exact quantity of light, warmth, and moisture it requires, can be understood only by those who have seen clusters of them hidden in the deep shade of the tree-crowns, while others are exposed to the scorching rays of the sun in the vicinity of a river or in some clearer part of the forest; some species thriving on the bare rock almost, and others clinging fast with their white rootlets to the moist rotting bark of a tree. . . .

But of far greater importance to the half-civilized riverines than either palms or orchids, for whose beauties they have no eye, are the cacao and the caoutchouc-tree (*Siphonia elastica*), products of the virgin forest essential to the future prosperity of the whole country.

Although India contributes to the supply of caoutchouc, the precious resin which is transformed into a thousand different shapes every year in the factories of Europe and North America, and sent to the ends of the earth, it cannot compete with Brazil, which takes the first place among the rubber-producing countries, in respect as well of the vastness of its export of the material as of its superior quality.

On the shores of the Amazon its production, it is true, has already been diminished by unreasonable treatment of the trees; the idea of replacing the old ones by young saplings never having presented itself, apparently, to the mind of the indolent population; but the seringaes, or woods of rubber-trees, on the banks of the Madeira, the Purús, and other tributaries of the main river, still continue to furnish extraordinary quantities of it. The province of Amazon alone exports more than fifty thousand arrobas (one million six hundred thousand pounds) yearly, while the total

of the exports of the whole basin slightly exceeds four hundred thousand arrobas, or twelve million eight hundred thousand pounds, per annum. . . .

Unfortunately, there has not been until now the slightest attempt made to cultivate this useful tree; and all the caoutchouc exported from Pará is still obtained from the original seringa groves. The trees of course suffer, as they naturally would under the best of treatment, from the repeated tapping and drawing-off of their sap, and the rubber collectors, therefore, must look about for new groves of the tree in the unexplored valleys of the more distant interior.

The planting of the *Siphonia elastica* would be a more profitable investment, as it yields the precious milk in the comparatively short space of twenty or twenty-five years; but, under the combined influence of the indolence of the mestizoes and the shortsightedness of the government, measures to that end will be adopted and carried into effect only when the rubber exportation shall have diminished with the destruction of the trees, and when European and North American manufacturers shall have found out a more or less appropriate substitute for the too costly resin.

Near the Praia de Tamanduá we acquainted ourselves with all the particulars respecting the collection and preparation of the caoutchouc at the cottage of a Bolivian seringueiro, Don Domingo Leigue. As I have already stated, the Siphonia grows, or at least thrives, only on a soil wherein its stem is annually submerged by the floods to the height of three feet or more. The best ground for it, therefore, is the *igapó*, the lowest and most recent deposit of the river; and there, in the immediate vicinity of the seringaes, may be seen the low thatches of the gatherers' huts, wretched hovels mostly, rendered tenantable during the inundations by the device of raising the floors on

wooden piles of seven feet height, in which the canoe, the seringueiro's indispensable horse, also finds a protected harbor. Unenviable truly must be the life of the happy proprietor, who has nothing to do in the seringal during the wet season, and who then has ample leisure to calculate exactly the intervals between his fits of ague, and to let himself be devoured by *carapanás*, *piums*, *motúcas*, and *mucuims;* under which euphonious names are known some of the most terrible of insect pests.

Narrow paths lead from the cottage, through the dense underwood, to each separate tree; and, as soon as the dry season sets in, the inmate of the palace just described betakes himself with his hatchet into the seringal, to cut little holes in the bark. The milk-white sap immediately begins to exude into pieces of bamboo tied below, over little clay cups set under the gashes to prevent their trickling down the stems. The collector travels thus from trunk to trunk; and, to facilitate operations, on his return visit he pours the contents of the bamboos into a large calabash provided with liana straps, which he empties at home into one of those large turtle-shells so auxiliary to housekeeping in these regions, serving as they do for troughs, basins, etc.

Without any delay he sets about the smoking process, as the resinous parts will separate after a while, and the quality of the rubber so become inferior. An earthen jar, without bottom and with a narrow neck, is set by way of chimney over a fire of dry urucury, or uauassú palm-nuts, whose smoke alone, strange to say, has the effect of instantly coagulating the caoutchouc sap, which, in this state, greatly resembles rich cow's milk. The workman, sitting beside this "chimney," through which roll dense clouds of a smothering white smoke, from a small calabash pours a little of the milk on a sort of light wooden shovel,

always careful, by proper management of the latter, to distribute it evenly over the surface. Thrusting the shovel into the thick smoke over the opening of the jar, he turns it several times to and fro with great rapidity, when the milk is seen to consolidate and to take a grayish-yellow tinge.

Thus he puts layer upon layer, until at last the caoutchouc on both sides of the wood has reached about an inch in thickness, when he thinks the "plancha" ready. Cutting it on one side, he takes it off the shovel and suspends it in the sun to dry, as there is always some water between the several layers, which should, if possible, evaporate. A good workman is thus able to prepare five or six pounds of solid seringa in an hour. The plancha, from its initial color of a clear silver-gray, turns shortly into a yellow, and finally becomes the well-known dark brown of the rubber, such as it is exported.

The more uniform, the denser and freer of bubbles, the whole mass is found to be, the better is its quality and the higher the price it fetches. Almost double the value is obtained for the first-rate article over that of the most inferior quality, the so-called sernamby or cabeça de negro (negro's head); which is nothing but the drops collected at the foot of the trees, with the remains of the milk scraped out of the bottoms of the calabashes. The rubber of India is said to be much like this sernamby, and, like it, to be mixed with sand and small pieces of bark. By way of testing the quality, every plancha is cut through again at Pará; by which means discovery is made, not only of the bubbles, but also of any adulteration that might be effected with the milk of the mangaba, that fine plant with dark glossy leaves, now found so often in European saloons under the erroneous name of rubber-plant. . . .

The wild cacao, with its large lancet-shaped hanging

leaves, and its cucumber-like fruit springing directly from the stem, is one of the characteristic features of the *virgem* [or solid soil], on which it often forms dense thickets, which are all the more impenetrable that the boughs—exhibiting frequently at the same time the small reddish flowers and the ripe golden fruit, in which the seeds lie embedded in a sweet white marrow—bend to the ground and there take root again.

But the india-rubber and the cacao are not the only treasures worth collecting in these forests. Even now the export of the Pará nuts, the fruit of the *Bertholletia excelsa*, yields an annual revenue of two hundred thousand dollars; and the copaiba oil and the urucú, the seeds of the *Bixa orellana*, used for dyeing, about one hundred thousand dollars. These sums seem small enough, it is true, but there are perhaps a hundred times those values of the rich-flavored nuts rotting unheeded in the forests, and above a score of other rich oily seeds, at present collected only for the use of the natives, not to mention several resins which yield the finest varnishes, plants giving the most brilliant hues, and others with fibres that would serve not only for the finest weavings, but also for the strongest ropes; besides about forty of the most indispensable drugs, all which might become most valuable articles of export. . . .

Notwithstanding the fertility of tropical vegetation, I doubt whether any other part of the world, in the same latitude, can offer as great a number of useful plants as does the Amazon Valley; and now, when all-transforming steam is about to open up to us this rich emporium, European industry should take advantage of the hitherto neglected treasures. What might not be done with the fibres, some of which surpass our hemp and flax in all respects? The curauá, for example, a sort of wild pine-apple, gives a delicate transparent flax of a silky lustre, such as

is used in the Philippine Islands, on a large scale, it appears. It is sold under the name of *palha* at Rio de Janeiro. The tucum and the javary would make excellent ropes, cords, nets, etc., well calculated to resist moisture and rot; and the piassaba, the murity, etc., would readily supply solid brushes, brooms, hammocks, hats, baskets, mats; while the snow-white bast of others would give excellent paper.

The lianas or cipós of these countries are, besides their minor uses, quite indispensable to the half-civilized natives for the construction of their light cottages, taking the place (as they do) of our nails and cramp-irons, beams, posts, and rafters. The whole palm-leaf roof is fastened, and artificially interwoven and intertwined, with tough creepers of nearly an inch thickness. . . .

In the hot lowlands of the Amazon, in the shade of endless forest, there is many an herb of mysterious virtue, as yet known only to wild Indian tribes, while the fame of others has already spread over the ocean. Who has not heard of the *urary*, or *curare*, the quick arrow-poison which, in the hands of clever physiologists and physicians, promises not only to become a valuable drug, but to give us interesting disclosures on the activity of the nerves?

The wondrous tales of former travellers regarding the preparation of this urary have been rectified long ago. The venom of snakes is not used for it, but the juice of the bruised stems and leaves of several kinds of strychnos and apocyneas is simply boiled over a coal fire, mixed with tobacco-juice and capsicum (Spanish pepper), and thickened with the sticky milk of some Euphorbiacea to a hard mass. This manipulation, moreover, is not undertaken by the old squaws of the tribe, devoting themselves to a painful death thereby, as the old stories ran, but, as there is no danger whatever, by the young wives of the warriors, who look upon it as part of their household duties, or by the men

themselves. There are about eight or ten different poisons of similar, but not identical, composition and preparation, of which the urary of the Macusi Indians, and the curare, from Venezuela and New Granada, are considered the most powerful.

This dark-brown, pitchy substance, usually kept in little earthen pots, is lightly spread over the points of the weapons,—their long arrows, their light spears, and the thin wooden shafts, of about a foot long, which they shoot through immense blow-tubes (*sarabacanas*). Immediately upon the diffusion in the blood of the slightest portion of the poison, the limbs, one by one, refuse to work, as if overcome with torpor, while the mind apparently retains its activity until death ensues, which it does in a few minutes' time, from palsy of the lungs. It is strange that only those nerves are affected which regulate the movements depending on our own will, whereas those movements we cannot control—the beating of the heart, for example—continue unaltered to the very last. Experiments made by French physicians upon animals have shown that, if the lungs are artificially kept in activity for several hours, the poison will be rejected by natural means, and no bad consequences will ensue. Of late the principal objection to the employment of the urary in medicine—its unequal strength—has been completely overcome by the effective alkaloid—the curarin—being extracted. This is about twenty times as powerful as the urary, and has been used successfully in the treatment of tetanus. The Indians shoot birds and monkeys, which they wish to tame, with very weak curare, rousing them from the lethargy which overpowers them with large doses of salt or sugar-juice; and this treatment is said to be very effective, also, in the reduction of their wildness. . . .

The guraná, prepared from the fruit of the *Paullinia sor-*

bilis, is a hard, chocolate-brown mass, of a slightly bitter taste, and of no smell whatever. It is usually sold in cylindric pieces of from ten inches to a foot in length, in which the half-bruised almond-like seeds are still distinguishable; the more homogeneous and the harder the mass, the better is its quality. To render it eatable, or rather drinkable, it is rasped as fine as possible on the rough, bony roof of the mouth of the *sudis gigas* (pirá-rucú), and mixed with a little sugar and water. A teaspoonful in a cup of warm water is said to be an excellent remedy in slight attacks of ague.

The taste of this beverage, reminding one slightly of almonds, is very palatable; still, it scarcely accounts for the passionate liking entertained for it by the inhabitants of the greater part of South America. It must be the stimulating effects of the paullinin it contains (an alkaloid like caffeïne and theïne) that render it so indispensable to those who have been accustomed to it. All the boats that come lightly freighted with ipecacuanha and deer- or tiger-hides, from Mato Grosso down the Arinos and the Tapajoz, in face of the considerable cataracts and rapids of the latter, take their full loads of guaraná at Santarem; and the heavy boats of the Madeira also convey large quantities of it to Bolivia; for at Cuyabá, as well as at Santa Cruz de la Sierra and Cochabamba, there are many who cannot do without their guaraná, for which they often have to pay thirty francs the pound, and who prefer all the rigors of fasting to abstinence from their favorite beverage. On the other hand, the mestizo population on the Amazon, where it is prepared on a large scale by the half-civilized tribes of the Mauhés and Mundurucús and sold at about three francs the pound, are not so passionately attached to it; they rather take coffee and a sort of coarse chocolate, which they manufacture for themselves.

CANOE- AND CAMP-LIFE ON THE MADEIRA.

FRANZ KELLER.

[To the extract just made from Keller's "Amazon and Madeira Rivers," we add the following, in which an interesting account of camp-life in the forest and river regions of Brazil is given.]

THE lower course of the Madeira presents, for more than four hundred and sixty miles, a picture of grand simplicity, and, it must be owned, monotony, which, magnificent as it appears at first, wearies the eye and sickens the heart at last,—a dead calm on an unruffled, mirror-like sheet of water glaring in the sun, and, as far as the eye can reach, two walls of dark-green forest, with the dark-blue firmament above them; in the foreground, slender palms and gigantic orchid-covered trunks, with blooming creepers hanging from the wave-worn shore, with its red earthslips, down into the turbid floods. No hill breaks the finely-indented line of the foliage, which everywhere bounds the horizon, only here and there a few palm-covered sheds peep out of the green; and still more rarely do we sight one of their quiet dark inmates. Stately kingfishers looking thoughtfully into the river, white herons standing for hours on one leg, and alligators lying so motionless at the mouth of some rivulet that their jaggy tails and scarcely protruding skulls might easily be taken for some half-sunken trunks, are the only animals to be seen, and certainly they do not increase the liveliness of the scene. Dreary and monotonous as the landscape, the days, too, pass in unvaried succession.

With the first dawn of day, before the white mist that hides the smooth surface of the river has disappeared with

the rays of the rising sun, the day's work begins. The boatswains call their respective crews; the tents are broken up as quickly as possible; the cooking apparatus, the hammocks and hides that served as beds, are taken on board, together with our arms and mathematical instruments, and every one betakes himself to his post. The *pagaias* (paddles) are dipped into the water, and the prows of our heavy boats turn slowly from the shore to the middle of the stream. Without the loss of a minute, the oars are plied for three or four hours at a steady but rather quick rate, until a spot on shore is discovered easy of access and offering a dry fire-place and some fuel for the preparation of breakfast. If it be on one of the long sand-banks, a roof is made of one of the sails, that rarely serve for anything else; if in the wood, the undergrowth, in the shade of some large tree, is cleared for the reception of our little table and tent-chairs.

The functions of the culinary *chef* for the white faces, limited to the preparation of a dish of black beans, with some fish or turtle, are simple enough, but, to be appreciated, certainly require the hearty appetite acquired by active life in the open air. The Indians have to cook by turns for their respective boats' crews; their unalterable bill of fare being a pap of flour of Indian corn or mandioca, with fresh or dried fish, or a piece of *jacaré* (alligator).

Most of those who are not busy cooking spend their time preparing new bast shirts, the material for which is found almost everywhere in the neighborhood of our halting-places. Soon the wood is alive with the sound of hatchets and the crack of falling trees; and, even before they are summoned to breakfast, they return with pieces of a silky bast of about four and a half yards long and somewhat less than one and a quarter yard wide. Their implements for shirt-making are of primitive simplicity,—

a heavy wooden hammer with notches, called maceta, and a round piece of wood to work upon. Continuously beaten with the maceta, the fibres of the bast become loosened, until the originally hard piece of wood gets soft and flexible, and about double its former breadth. After it has been washed, wrung out to remove the sap, and dried in the sun, it has the appearance of a coarse woollen stuff of a bright whitish-yellow or light brown, disclosing two main layers of wavy fibres held together by smaller filaments. A more easily prepared and better working-garment for a tropical climate is hardly to be found than this, called cáscara by the Indians of Bolivia, and turury by those of the Amazon. Its cut is as simple and classical as its material. A hole is cut in the middle of a piece about ten feet long, to pass the head through, and the depending skirt is sewn together on both sides, from below up to the height of the girdle, which usually is a piece of cotton string or liana.

Another branch of industry our Indians were busy at, in their hours of leisure, was the fabrication of straw hats, with the young leaves of a kind of little palm, the same which supplies the excellent hats imported from Ecuador and Peru, and known in Europe under the name of Chile or Panama hats. Dexterity at all sorts of wicker-work seems to be innate to this race; and the prettiest little baskets and the finest mats of colored palm-leaves are to be bought on the Missions of the Mamoré at the lowest prices.

But all these occupations are left at the call of the first mate, who has the proud title of Capitano. The boats' crews crowd round their pots, each one receives his allotted portion in a calabash or a basin of horn, and their spoons of the same material are soon in full activity. If a jacaré has lately been shot, or caught in a *laço* (sling), every one,

A SOUTH SEA ISLAND

after roasting his own piece of it on the spit, proceeds to cut at the large slices of the white meat (which, though in appearance like fish, is as tough as india-rubber) with the satisfaction usually produced by three or four hours of hard rowing on view of anything eatable. One tribe especially, the Canichanas, from the former Mission of San Pedro at the Mamoré, think roast caiman the finest eating in the world; while others, the Cayuabas from Exaltacion, and the Mojos from Trinidad, whose palates are somewhat more refined, prefer beef, fish, or turtle to the musk-exhaling saurian. Notably the turtles, which are not found on the Guaporé and Mamoré (they are not met with above the rapids of the Madeira), are prized by them, though *we* grew rather tired of them, and I wonder. On the lower Madeira, at our fires, there was almost daily going on the cooking of turtles, of all sizes, from the full-grown one of a yard in length to the smallest of the size of a hand; and in every variety of preparation, too,—whole, and chopped up as for soup; stewed; and roasted in their own shell or on the spit.

Bathing in the river, immediately after meals, is a luxury invariably indulged in by all the Indians; and I never remarked that it was attended by any evil consequences to them.

After a rest of two hours' duration, the cooking utensils, the hammocks, and improvised tents were carried on board again, and the voyage continued. A second halt was made after rowing for two or three hours, when we came in sight of a good place for fishing, such as the mouth of some smaller river, or an extensive mud-bank. Such places were usually recognizable from afar, by the multitude of snow-white herons and of long caimans, which, finding it out before us, crowded there in peaceful unity, and with similar intentions. The vicinity of the scaly monsters is

scarcely heeded by the Indians, who fish and take their bath, laughing and jesting, though somewhat hugging the shore, just as if there were no such thing as the tail or the tooth of the jacaré in the world; and, indeed, these creatures are themselves in much greater danger than the redskins. When the last steak of alligator has been consumed, one of the Canichanas is sure to ask leave to have some fun, and to provide at the same time for their next dinner. Of course the permission is always granted, as the sport keeps up their spirits and spares our provisions. Without loss of time, then, one of them, having carefully fastened a strong loop of raw hide at the end of a long pole, and having dexterously slipped off his bast shirt, creeps slowly through the shallow water, pole and sling in hand, as near as possible to the alligator, which looks on at these preparations with perfect apathy, only now and then betraying a sign of life by a lazy movement of its powerful tail. But it does not take its eyes off the Indian as he crawls nearer and nearer. The fatal sling is at arm's length from its muzzle, and yet it does not see it. As if under the influence of witchcraft, it continues to stare with its large protruding eyes at the bold hunter, who in the next moment has thrown the loop over its head, and suddenly drawn it to with a strong pull. The other Indians, who the while have been cowering motionless on shore, now rush into the water to the help of their companion, and four or five of them land the ugly creature that with all its might struggles to get back into the water, lashing the sand with its tail and showing its long teeth; but a few vigorous blows with an axe on the tail and skull soon render it tame enough. If, instead of dragging back, the alligator were only to rush forward boldly to the attack of the Indians, they would, of a certainty, leave pole and sling and run for their lives; but this bright idea never seems

to occur to the uncouth animal, and the strife always ends with its death. Though there were more than a dozen of them killed during the voyage, I never thought of sending a rifle-bullet through the thick skull of one, except on one occasion, when I was afraid that one of our Canichanas was about to make too close an acquaintance with the hard, jagged tail of an extraordinarily strong monster, which measured full sixteen and a half feet.

Even before the huge spoil is cut up, four musk-glands, placed by twos under its jaw, and on its belly, near the beginning of the tail, must be carefully taken out, to prevent the diffusion, over the whole body, of the penetrating odor of the greasy, brown liquid they contain. These glands, which are about an inch and a half long and as thick as a finger, are carefully tied up and suspended in the sun to dry. Mixed with a little rose-water, their contents serve, as we were told, to perfume the raven-black tresses of the elegant Bolivian ladies at Santa Cruz de la Sierra and Cochabamba, in spite of, or rather by reason of, their strong scent, which gives the headache to all save these strong-nerved señoritas, who love a bull-fight above everything, who know how to roll the cigarrito, and to dance the fandango with matchless grace, but who scarcely are able to write their own names.

After such a pleasant interlude of fishing or hunting, the paddles are plied with renewed vigor until the evening, when sleeping quarters are selected, either on a sand-bank or in the forest. The canoes are moored by strong piassaba ropes in some recess of the bank, where they are protected against drifting trunks; the tents are erected, and preparations ensue for the principal meal. Meanwhile, after the very short interval of twilight usual in the tropics, night almost suddenly throws her dark veil over the valley, and the bright constellations of the southern sky in quiet majesty adorn the firmament.

While we prepare to take astronomical observations, half a dozen large fires are lighted round about, in whose fitful blaze the neighboring forest-trees appear like huge phantoms, looking contemptuously down on us, poor tiny mortals. Our Indians warm themselves in the cheerful glow, smoking, and chatting of the day's adventures, or rather of what are regarded as such,—unusual good or ill luck at fishing and hunting; the casual meeting of some canoe; or the sight of a seringueiro's poor cottage. Work over, they take off the rough cáscara, and put on the camiseta, a cotton garment without sleeves, resembling a wide poncho sewn together at the sides, and whose dazzling whiteness is set off by two scarlet stripes along the seams. The ample folds and the simple cut of the garment, which is made by the Indian women of the Missions on very primitive looms, give quite a stately, classical appearance to the numerous groups round the fires. Such must have been the aspect presented by the halting-places of those daring seafarers, the Phœnicians, who were the first to call into life an international commerce, and whose light-rigged barques first ventured to distant shores, to bring home the precious amber and the useful tin. Only the dense swarms of mosquitoes, which set in immediately after sunset, remind us rather unpleasantly that we are far off from those happy northern regions, where such a nuisance can hardly be well imagined. Especially in the dense forest beneath cacao-bushes, or under the close leafage of the large figueiras, where no breath of air incommodes those light-winged tormentors, it is quite impossible, for the European at least, to close an eye without the shelter of a mosquiteiro (mosquito-net); and we could but wonder at our Indians, most of whom did without it. After supper they simply spread a hide on the ground, on which, with no covering other than the starry firmament

above them, they slept undisturbed till the dawn, only occasionally brushing away, as if by way of diversion, the most obtrusive of the little fiends. The capitanos only, and one or other of the older rowers, allow themselves the luxury of good cotton hammocks, which are also made by their wives in the Missions.

Such, with few variations, was the course of our daily life, until we reached the regions of the rapids, when, of course, the hundred little incidents connected with the dragging of the canoes through narrow, foaming channels, and with carrying the goods and the vessels themselves overland, disturbed the monotony of this rude forest life.

BESIEGED BY PECCARIES.

JAMES W. WELLS.

[It is to "Three Thousand Miles through Brazil, from Rio de Janeiro to Maranhão," by James W. Wells, F.R.G.S., that we owe the following exciting example of the perils of a hunter's life in the wilds of the tropics. Mr. Wells and his fellow-travellers, while journeying up the valley of the Sapão, far in interior Brazil, came upon traces of the peccary, an animal which, from its fearlessness, and its habit of moving in troops, is occasionally a very unsafe creature to meet. What followed we shall leave the author to tell.]

WE were down in the deep, narrow valley, where the slopes of the table-land surrounded us like a wall, up which there was no visible ascent. The tall, rank grass was also littered with boulders of sandstone and short, gnarled, and distorted cork-trees; it was a toilsome march for both men and animals, but there, certainly, must be the head-quarters of all the peccaries of the region, for everywhere the ground was furrowed and rooted up, the grass trodden down in

long lanes, the pools of water turbid, from their wallowing, and the place odorous as a rank pigsty; and yet, strange to say, not a pig was to be seen, fortunately for us; for in such an inconvenient place an attack from these vicious animals in the numbers they could evidently collect would have enabled them to take us at great disadvantage.

We pushed on the animals to get out of this pig-set man-trap, and eventually got clear of the labyrinth on the farther side of the last feeder of the main morass, and, after some difficulty, found an ascent on to the *geraes*, where we made a bee-line to the Sapãc across the flats.

During the passage of the swamps the Don said,—

"Ah! Senhor Doctor, what a shame to leave such a lovely place; if you and I were only here to-night, what fun we would have with the peccaries; but, patience, they will make us a visit to-night, because of the trail of the dogs."

But neither time nor place would permit of carrying out the Don's desires, as there was neither water nor pasture for the animals. The Don's remark about the peccaries paying us a visit is owing to a popular belief that these animals, when in considerable numbers, will follow a dog's trail for many miles, and attack and kill him. In fact, it is customary with the hunters to imitate the barking of a dog to attract the attention of the pigs, and induce them to collect together and make an attack; when, the hunters being safely ensconced in trees, the game is perfectly safe, as the men have only to shoot what they require.

The ground traversed that afternoon was not so free from bush as we had hitherto found, being in many places thickly covered with dense cerrado (abounding in immense quantities of the india-rubber-producing Mangaba-tree), where progress was very slow and difficult, and required the free use of our wood-knives. After a long and weari-

some march, we reached the valley of the Sapão again, quite eight miles from the peccaries' haunt.

I found the river valley presented much the same characteristics as we had found lower down. For the purposes of a railway it is admirable; the gradients are practically level, and the only works of art required would be in crossing the many *burity* swamps that intersect the route, and these, although numerous, are narrow.

Even the Rio Sapão itself could doubtless be made into a good canal, in the absence of a railway, for there is plenty of water, and the ground offers great facilities for straightening its course.

Especial care was taken in preparing the camp that night. The Don and José superintended the operation of constructing the fort, the sides of which were further protected by spreading over them the hides used for covering the packs of the mules. Bush was also cut to make up and enlarge the defences, and a strong stake was driven into the ground inside the fort for the purpose of securing the dogs in case the peccaries arrived. The camp was made on the borders of a clump of trees, to which we were enabled to sling the hammocks, no one caring to sleep on terra firma that night, but two of the men who were unprovided with hammocks spread their hides on the ground inside the fort.

After dinner, of course, peccaries formed the sole subject of conversation, but hour after hour went by, yet no signs of their presence appeared; and, after arranging the watches for the night, we turned in, and with the fatigues of the day I was soon asleep.

It appeared to me, however, that I had barely closed my eyes, when I felt my hammock violently shaken. It was the Don awakening me, saying, "Wake up, here are the *porcos*, we are going to have some fun." The first peculiar-

ity that struck me was the prevalence of the odor of old pigsties. I sat up, looked around, and listened. The pitchy blackness of night surrounded us, but the fire, burning brightly, sent its flickering light upon the tree-trunks, the foliage, and the hammocks; two men were in the fort with gun and knife in hand, and the dogs tied to their stake were with difficulty kept quiet, and vented their excitement in deep growls. As I listened it became evident that we were surrounded by some animals, for in many directions was heard, in the stillness of night, the sound of bodies moving through the bush, twigs snapping, grass rustling, etc. It was a moment of suspense, but not for long; for suddenly, from all around us, came a blood-curdling sound of the simultaneous snapping of teeth from vast numbers of the enemy, followed by the appearance of a crowd of charging black animals, rushing with wonderful speed towards a common centre, the fort. We in the hammocks each lighted a coil of wax tapers that were prepared ready for the occasion.

And what a scene ensued! the fire was rapidly scattered, and partly extinguished; under and around us was a seething mass of black peccaries, barely distinguishable in the dim light, but all pushing and struggling to the front; the men in the fort had discharged their weapons, and were hard at work, hacking and thrusting at the peccaries as they endeavored to swarm up the smooth surface of the hides that covered the sides of the fort. The men in the hammocks, after discharging their guns, reached down and slashed with their knives at the swarming animals below them.

The attack was more like the wild, reckless bravery of the Arabs of the Soudan, for as pig after pig fell squealing and disabled, scores more struggled for his place. The faint light of the tapers and the partly extinguished fire

served but to dimly illuminate the elements of the strange, noisy, wildly weird scene; the trunks of the surrounding trees and their foliage; the swinging hammocks with their occupants reaching downward, cutting and thrusting with their long, gleaming knives; the dim figures of the men in the *trincheria*, repelling with shouts and thrusts the swarming enemy; the wild, rushing, charging forms of the black bodies of the peccaries, as in great numbers they threw themselves against the fort, regardless of being struck down one after the other, and always impelled forward by those in the rear struggling to the front; others made ineffectual attempts to reach our hammocks or viciously gashed the trees that gave us support; the extremely disagreeable and nauseous odors of the animals, their snapping of teeth, like musketry file-firing, the reports of the firearms, the shouts of the men, the howling and barking of the dogs, and the dim light, created an indescribably strange and exciting scene. Every bullet of my revolver took effect. I shouted to the men to reserve their fire, and fire volleys, but it was like talking in a gale of wind at sea.

In spite of all efforts, still the battle raged. The animals appeared to be in immense numbers, for, as far as the faint light would permit, the ground was seen covered with their moving bodies, rushing, struggling, the strongest beating down the weakest, grunting, squealing, and snapping their teeth; and noticeable above everything was the abominable exhalations from their bodies, an odor like a combination of rank butter and garlic.

I was getting anxious not only for my baggage, but for the men behind the fort, who had to cut and thrust like madmen; the excitement was intense. The strong raw hides were ripped up as though slashed with a sharp knife, and the bags of beans and farinha were freely streaming

their contents on the ground from innumerable rippings from the keen sharp tusks.

Although we in the hammocks were quite safe, the fort was trembling; many of the saddles and bags had been displaced by the sheer pressure of the enemy. Our few miserable firearms appeared to have no more effect than so many pop-guns, although the ground was becoming strewn with the bodies of the slain and disabled. At last I succeeded in getting the men in the hammocks to fire volleys at a given place, and after a time this appeared to have an effect, for as suddenly as the attack commenced, so it ceased; and the animals withdrew simultaneously and in silence.

The Don (his voice chuckling with glee) called to us to get ready again, as they would probably return. "Ah!" said he to me, in a low voice, "what a splendid time we are having!" I thought, however, of the men in the fort, one of whom was stanching blood from his wrist. I told the Don to go and reinforce them; but suddenly the Don became very deaf; he was very snug in his hammock and really could not hear me; but José, like a good fellow, got out, ran for the fort, jumped in, and helped the men to make good the damages. We could still hear the pigs in the bush, and presently, without a moment's warning, we again heard that diabolical crash of teeth from a complete circle around us, followed immediately by another wild charge, and the battle was again renewed with all its excitement; but then, after the first flush of excitement, we became cooler, and José in the fort was a host in himself; this attack was of much shorter duration, and the enemy once more suddenly retreated. In the pause that then ensued I thought of Rodrigues, as it then occurred to me that I had not hitherto noticed him; his hammock was quite still, and its edges drawn together over his body, that

formed a round, ball-like protuberance in the centre. I saw it all, and could picture the poor terror-stricken man, coiled up, with blanched face and bated breath and making himself as small as possible. The men in the fort had behaved very pluckily.

Six or seven other attacks eventually followed, but each one became weaker, and at intervals between of longer duration. The eventful night seemed interminable, and finally it was not until near daybreak that we heard the last grunt.

At the first lights of gray dawn José proposed to reconnoitre, and went off for the purpose. At first he proceeded very gingerly from tree to tree. I proposed to myself to go also, but just at that moment I had a fellow-feeling for the Don's deafness, and thought what a comfortable place a hammock was, and that really I could do no good; and further I remembered that generals should always occupy high, commanding positions; every one was chary of moving from their places of security.

José soon afterwards returned, and reported that the enemy had finally withdrawn.

Thoughts of the horses and mules then occurred to us, and we anxiously awaited their arrival, for they had acquired the habit of appearing in camp of their own accord in the early morning for their matutinal feed of corn. Thankfully I saw three or four soon after arrive, but two men had to go for the others, that were fortunately found browsing on a plentiful supply of the shoots of young bamboos. Happily the animals had been pasturing in a direction opposite to that from whence the peccaries came, otherwise there would have been a stampede.

Almost the first thing the men did after the final retreat of the peccaries was to slash the skin on the top of the loins of the defunct enemy, and extract the gland that

creates the disgusting odor peculiar to these animals; for if not extracted soon after death, it taints the flesh to such an extent as to render it uneatable except by Indians, who do not object to any flavor, and eat all their animal food cooked on the same principle as a European cook prepares a woodcock. There were twenty-seven dead pigs found in and about the camp, and also several wounded, to whom it was necessary to give the *coup de grâce*. The wounds were mostly from the knives and small axes, but a very considerable number of the wounded must have got away to recover, or linger unfortunately in pain.

Six of the plumpest were selected for drying and salting, the preparations for which, and also to repair the damages done to the bags of provisions, delayed our departure for some time.

An examination of these animals showed them to be a species of peccary resembling that known as the *Dicotyles labiatus*, but an essential difference was noticeable in the absence of the white lips that give the name to that species; our enemies had black snouts and dark lips, otherwise they corresponded in other points.

They had four incisors on the upper jaw, and six molars on each side above and below; while the tusks, although smaller than a pig's, are much finer and sharper, inclined slightly backward, and closely overlap each other. Some of the bodies of the animals measured thirty-six inches in length. They are more slender in build than the common pig, and covered with long, stiff bristles, colored with alternate rings of gray, light-brown, and black. These colors vary with the size and age of the animals; and as either one predominates, they cause the animal to appear either brown, gray, or black; the largest we found was almost entirely black, whereas the smallest had quite a brown appearance.

During the battle I could not help noticing the apparent

method of their movements, as though they were led by chiefs. It appears that their mode of attack on such an occasion as they favored us with is to surround in silence, by a complete circle, the object to be stormed; when, at a given signal, a simultaneous snapping of teeth takes place, followed by a general converging rush to the centre, whereby the largest and strongest reach the front first, and the smallest bring up the rear; their retreat is carried out on an equally methodical system. There is a small, red species known by the Guarany name of *caëitatu*;* our friends are known by the Brazilian cognomen of *queixadas*, or *porcos de matto*.

From what I had witnessed during the past night, I can quite understand how these courageous animals in large numbers are capable of surrounding and destroying a powerful jaguar; and if my dog Feroz had fallen among them, he would doubtless have made a brave fight, but he would not have had the slightest chance of escape, and fortunately for us the ropes of the hammocks did not break, as hammock-strings will sometimes do at untoward moments, otherwise I should not be here now to tell this tale.

But now, from the camp-fire, comes the odor of roast peccary, for parts of them were already roasting for breakfast, and emitting a vastly more acceptable odor to what they did when alive. When ready, it is needless to say that, after the long night and in the keen, dewy morning air, how appreciated were our visitors when cooked, and there was not the slightest trace of the objectionable odor.

[Shortly afterwards the hunters met another tenant of the Brazilian wilds.]

As several peccaries had crossed our path lately, José and the Don cut three long straight bamboos; to the ends

* *Dicotyles torquatos.*

of each we fastened our sharp-pointed knives, for the purpose of pig-sticking. But the first use we had for our lances was for a different animal; our dogs had suddenly disappeared into the tall grass, barking loudly, and a few moments afterwards a huge ant-bear came rolling out into the open semi-marsh land, followed by the dogs; it went at a good pace, but with most extraordinary and ludicrous movements. It became then very interesting to watch the sagacity of the dogs, as they hung well on to his rear, trying to seize only the tail of the animal, and keeping well out of reach of his powerful fore-legs armed with tremendous claws. The dogs, however, were evidently losing their caution and getting closer, and the cumbersome beast had already made some particularly rapid blows in attempting to rip the dogs. Fearing a possible disaster to my faithful Feroz, we galloped on, but it is amazing the speed these cumbersome ant-bears can develop. We had to put our animals to their sharpest paces to come up with the quarry, when we had the opportunity of fleshing our lances. The bear died hard, lying on its back and striking out with its forelegs. The men cut portions of the flesh to eat, but when afterwards prepared, I found it too strongly flavored with formic acid to be agreeable, and the dogs refused it.

It then occurred to me that the incident of the discovery by the Don of the robbery of a bees'-nest some days ago might possibly be explained by it having been taken by an ant-bear, and not by a prowling stranger as he supposed.

[The hunt of the ant-bear was followed a few days afterwards by a peccary-hunt, which proved a much less safe occupation.]

A little farther on, in a wide shallow depression, was our host's favorite hunting-ground (where he had often found

considerable quantities of peccaries), an immense *burityzal* that extended apparently from the Chapadas to the Rio Preto.

We halted at José's request and listened, and soon distinctly heard the grunt of the *porcos* among the *burityz*, where they feed on the fruits of the palms that form their favorite food.

Leaving the horses fastened to the trees of a thin *cerrado* that covered the sloping ground of the borders of the swamps, and haversacks, *ponchos*, and other *impedimenta* suspended to the branches, we advanced to the attack.

I confess to a feeling of trepidation and a certain bumping of the heart as we were about to leave the borders of the convenient trees so easy and apparently purposely constructed for a human retreat from the peccaries, but at that moment a troop of some dozen of them emerged from the jungle of the swamp out into the open marshy land, and disappeared into the adjoining tall grass.

Three of the sons of José, with Antonio, Bob, and José Grosso, started at a run to cut off their retreat, and soon disappeared amidst the tall grass a little lower down the hill. After a few moments of suspense, we heard reports of guns, and shouts to us to look out; at the same time another troop of peccaries appeared on the open marshes, and followed the tracks of the others. The grass became agitated by the movements of the animals, and they soon afterwards entered the more open ground of the *cerrado* where we were waiting, pursued by the five men; we all fired, but as the range was long, there was not much execution. The animals, about forty in number, now suddenly halted and faced their pursuers with vicious little stampings of feet and snapping of teeth, and suddenly charged down upon the men and upon ourselves. Never was such gymnastic agility displayed as in the way that each of us rushed

for, and scurried up, the nearest trees, many dropping their guns or knives in their hurry.

José and his sons were the coolest, especially the old man, who, perhaps a little too stiff for climbing, calmly placed his back against a tree, clasped it with his left hand, and leaning forward in a semi-stooping posture, with his long *facão* at the ready, awaited the furious charge.

How gallantly they come sweeping along with their muzzles well down, but within a few feet of our trees they suddenly halt, and, snapping their tusks, make short plunging charges. I had found a comfortable perch up a short gnarled tree, and taking careful aim at the peccaries near me, I knocked over three of them in five shots from my revolver.

They were charging José's legs at close quarters, but his long, keen, sharp-pointed knife flashes quickly as he rapidly delivers cuts and thrusts with telling effect. The other men, safely ensconced in the trees, have made good shots, but before any of us can reload the peccaries scamper away. All of us quickly descend from our perches and rush after the retreating animals, loading our guns as we run, but our brave foes suddenly halt and face us with a look of defiance, and again make a gallant charge. How ignominious we appeared as we in our turn beat a hurried retreat to the nearest trees, where, not having time or finding conveniences for a climb, we were forced to imitate José's example and face the enemy with knives; but the peccaries, after a momentary pause, dashed onward and disappeared amidst the tall grass of the borders of the swamps, crossed the marshes, and entered the jungle of the *buritys*.

Although the whole thing happened within a few moments, there were quite enough elements of danger to spice the sport, for, if in making our retreat any of us had

stumbled and fallen, the consequences must have been serious, if not fatal. I prefer the pig-sticking on mule-back with our extemporized spears. We gave the *coup de grâce* to the wounded, but many got away only partially damaged. We found our bag amounted to ten pigs, all in excellent condition.

As José and his sons were anxious for another tussle, we proceeded up the valley, and soon saw here and there a solitary grunter outside the growth of palms and aquatic vegetation of the swamps; and frequent grunts, heard amidst the groves, indicated the presence of considerable numbers of our foes.

A little farther on, a spit of firm land, only covered with short grass, extended to near the groves, but no one cared to venture so far from the friendly sanctuary of the trees and possibly meet a huge anaconda coiled up in the swamp.

José Grosso and one of our host's sons now returned to remain with the animals, whilst we proceeded a little farther on in quest of a stray peccary. We walked about a mile, but found not what we hoped for; but on returning some peccaries were seen straying towards the hills in twos or threes, homeward-bound to their lairs in the dells and grottos of the sources of streams at the foot of the bluffs of the Chapadas. We worked our way amidst the trees, and eventually obtained a few long shots, and succeeded in bagging two more.

It became a question whether we should pursue our journey to enable me to take my notes, and camp out and have another probable night-attack of peccaries, or return to Matto Grande. I thought a night of peace and quietness preferable, although perhaps very unsportsmanlike, and so we wended our way homeward.

It is rather unusual that these peccaries make such a

brave fight in daylight, but it was chiefly owing to their accidentally finding themselves in such considerable numbers on this occasion, as they are commonly scattered over their feeding-grounds in very small parties during the day, and return to a common haunt at night, whence they sally out in immense numbers upon any foe that trespasses upon their neighborhood, like when they tracked our dogs in the Sapão.

THE PERILS OF TRAVEL.

IDA PFEIFFER.

[Among travellers there have been few more ardent and enterprising than the woman from whose writings our present selection is made. Ida Pfeiffer was born in Vienna about 1795, married, brought up and educated her two sons, and in 1842, when nearly fifty years of age, set out on a series of travels which she had long contemplated, and in which she spent the succeeding ten years. After a series of travels in Asia Minor, Scandinavia, and Iceland, she set out in 1846 on a tour of the world, which was not accomplished without great hardships and dangers. In 1851 she entered on a second journey around the world, visiting various new countries. She died in 1858. From her "A Woman's Journey round the World" we select the following thrilling experience. She had set out from Rio Janeiro, in company with Count Berchthold, on an excursion to Petropolis, a German colony in the vicinity. Suddenly, in a lonely spot, a negro sprang out upon them, knife and lasso in hand, indicating by gestures that he intended to murder them and drag their bodies into the forest. She gives a vivid description of what followed.]

We had no arms, as we had been told that the road was perfectly safe, and the only weapons of defence which we possessed were our parasols, if I except a clasp-knife, which I instantly drew out of my pocket and opened, fully determined to sell my life as dearly as possible. We parried our adversary's blows as long as we could with our

parasols, but these lasted but a short time; besides, he caught hold of mine, which, as we were struggling for it, broke short off, leaving only a piece of the handle in my hand. In the struggle, however, he dropped his knife, which rolled a few steps from him; I instantly made a dash, and thought I had got it, when he, more quick than I, thrust me away with his feet and hands, and once more obtained possession of it. He waved it furiously over my head, and dealt me two wounds, a thrust and a deep gash, both in the upper part of the left arm; I thought I was lost, and despair alone gave me the courage to use my own knife. I made a thrust at his breast; this he warded off, and I only succeeded in wounding him severely in the hand. The Count sprang forward and seized the fellow from behind, and thus afforded me an opportunity of raising myself from the ground. The whole affair had not taken more than a few seconds.

The negro's fury was now roused to its highest pitch by the wounds he had received. He gnashed his teeth at us like a wild beast, and flourished his knife with frightful rapidity. The Count, in his turn, had received a cut right across the hand, and we had been irrevocably lost, had not Providence sent us assistance. We heard the tramp of horses' hoofs upon the road, upon which the negro instantly left us and sprang into the wood. Immediately afterwards two horsemen turned a corner of the road, and we hurried towards them; our wounds, which were bleeding freely, and the way in which our parasols were hacked, soon made them understand the state of affairs. They asked us which direction the fugitive had taken, and, springing from their horses, hurried after him; their efforts, however, would have been fruitless, if two negroes, who were coming from the opposite side, had not helped them. As it was, the fellow was soon captured.

He was pinioned, and, as he would not walk, severely beaten, most of the blows being dealt upon the head, so that I feared the poor fellow's skull would be broken. In spite of this, he never moved a muscle, and lay, as if insensible to feeling, upon the ground. The two other negroes were obliged to seize hold of him, when he endeavored to bite every one within his reach like a wild beast, and carry him to the nearest house. Our preservers, as well as the Count and myself, accompanied them. We then had our wounds dressed, and afterwards continued our journey, not, it is true, entirely devoid of fear, especially when we met one or more negroes, but without any further mishap, and with a continually increasing admiration of the beautiful scenery.

[The negro was supposed to be either drunk or insane, but it proved that he had been punished by his master for some offence, and took that mode to obtain revenge. Madame Pfeiffer penetrated the Brazilian forests, and thus describes the aboriginal savages.]

On a small space, under lofty trees, five huts, or rather sheds, formed of leaves, were erected, eighteen feet long by twelve feet broad. The frames were formed of four poles stuck in the ground, with another reaching across, and the roof of palm-leaves, through which the rain could penetrate with the utmost facility. On three sides these bowers were entirely open. In the interior hung a hammock or two, and on the ground glimmered a little fire, under a heap of ashes, in which a few roots, Indian corn, and bananas were roasting. In one corner, under the roof, a small supply of provisions was hoarded up, and a few gourds were scattered around; these are used by the savages instead of plates, pots, water-jugs, etc. The long-bows and arrows, which constitute their only weapons, were leaning in the background against the wall.

I found the Indians still more ugly than the negroes. Their complexion is a light bronze, they are stunted in stature, well-knit, and about the middle size. They have broad and somewhat compressed features, and thick, coal-black hair, hanging straight down, which the women sometimes wear in plaits, fastened to the back of the head, and sometimes falling down loose about them. Their forehead is broad and low, the nose somewhat flattened, the eyes long and narrow, almost like those of the Chinese, and the mouth large, with rather thick lips. To give a still greater effect to all these various charms, a peculiar look of stupidity is spread over the whole face, and is more especially to be attributed to the way in which their mouths are always kept open. Most of them, both men and women, were tattooed with a reddish or blue color, though only round the mouth, in the form of a moustache. Both sexes are passionately fond of smoking, and prefer brandy to everything. Their dress was composed of a few rags, which they had fastened round their loins.

The good creatures offered me the best hut they possessed, and invited me to pass the night there. Being rather fatigued by the toilsome nature of my journey on foot, the heat, and the hunting-excursion, I very joyfully accepted their proposition; the day, too, was drawing to a close, and I should not have been able to reach the settlement of the whites before night. I therefore spread out my cloak upon the ground, arranged a log of wood so as to serve instead of a pillow, and for the present seated myself upon my splendid couch. In the mean while my hosts were preparing the monkey and the parrots, by sticking them on wooden spits and roasting them before the fire.

In order to render the meal a peculiarly dainty one, they also buried some Indian corn and roots in the cinders. They then gathered a few large fresh leaves off the trees,

tore the roasted ape into several pieces with their hands, and, placing a large portion of it, as well as a parrot, Indian corn, and some roots, upon the leaves, put it before me. My appetite was tremendous, seeing that I had tasted nothing since the morning. I therefore immediately fell to upon the roasted monkey, which I found superlatively delicious; the flesh of the parrot was far from being so tender and palatable.

[As we have begun this selection with a perilous adventure of our lady traveller, some other perils encountered by her in other parts of the world may fitly close it. The following experience in a tiger-hunt took place in India, during an excursion to the rock temples of Ellora.]

I had scarcely left the gates of the town behind, when I perceived a number of Europeans seated upon elephants, coming from the bungalow. On meeting each other we pulled up and commenced a conversation. The gentlemen were on the road to search for a tiger-lair, of which they had received intimation, and invited me, if such a sport would not frighten me too much, to take part in it. I was greatly delighted to receive the invitation, and was soon seated on one of the elephants, in a howdah about two feet high, in which there were already two gentlemen and a native,—the latter had been brought to load the guns. They gave me a large knife to defend myself, in case the animal should spring too high and reach the side of the howdah. Thus prepared, we approached the chain of hills, and after a few hours we were already pretty near the lair of the tigers, when our servants cried out softly, "*Bach, Bach!*" and pointed with their fingers to some brushwood.

I had scarcely perceived the flaming eyes which glared out of one of the bushes before shots were fired. Several balls took effect upon the animal, who rushed, maddened, upon us. He made such tremendous springs, that I

thought every moment he must reach the howdah, and select a victim from among us. The sight was terrible to see, and my apprehensions were increased by the appearance of another tiger; however, I kept myself so calm, that none of the gentlemen had any suspicion of what was going on in my mind. Shot followed shot; the elephants defended their trunks with great dexterity by throwing them up or drawing them in. After a sharp contest of half an hour, we were the victors, and the dead animals were triumphantly stripped of their beautiful skins. The gentlemen politely offered me one of them as a present; but I declined accepting it, as I could not postpone my journey sufficiently long for it to be dried.

[Madame Pfeiffer had a courage and presence of mind in dangerous and difficult situations which often served her in good stead. Certainly it needed no slight courage to undertake the adventure described in our next selection, a journey among the cannibal Battakers of Sumatra. In 1835 two American missionaries had been killed and eaten by them, and such a journey without a military escort seemed foolhardy. But she persisted, and reached a village on the borders of the Battaker territory July 19, 1852. Here she sent for the regents of the neighboring villages.]

In the evening we sat in solemn conclave surrounded by regents, and by a great crowd of the people, for it had been noised abroad far and wide that here was a white woman who was about to venture into the dreaded country of the wild Battakers. Regents and people all concurred in advising me to renounce so perilous a project; but I had tolerably made up my mind on this point, and I only wanted to be satisfied as to one thing,—namely, whether it was true, as many travellers asserted, that the Battakers did not put their victims out of their pain at once, but tied them living to stakes, and, cutting pieces off them, consumed them by degrees with tobacco and salt.

The idea of this slow torture did a little frighten me; but my hearers assured me, with one accord, that this was only done to those who were regarded as criminals of a deep dye, and who had been on that account condemned to death. Prisoners of war are tied to a tree and beheaded at once; but the blood is carefully preserved for drinking, and sometimes made into a kind of pudding with boiled rice. The body is then distributed; the ears, the nose, and the soles of the feet are the exclusive property of the rajah, who has besides a claim on other portions. The palms of the hands, the soles of the feet, the flesh of the head, and the heart and liver, are reckoned peculiar delicacies, and the flesh in general is roasted and eaten with salt. The regents assured me, with a certain air of relish, that it was very good food, and that they had not the least objection to eat it. The women are not allowed to take part in these grand public dinners. A kind of medicinal virtue is ascribed to trees to which prisoners have been tied when they have been put to death, and the stem is usually cut into sticks five or six feet long, carved into figures or arabesques, and decorated with human hair; and these sticks are taken in hand by people who go to visit the sick, or when any medicine is to be given.

[Despite this gruesome warning, the daring woman continued her journey, and prosecuted it until the 13th of August, when she found herself in the most imminent peril.]

More than eighty armed men stood in the pathway and barred our passage, and before we were aware of it, their spearmen had formed a circle around me and shut me in, looking the while indescribably terrible and savage. They were tall robust men, fully six feet high; their features showed the most violent agitation, and their huge mouths and projecting teeth had really more resemblance to the

jaws of a wild beast than to anything human. They yelled and made a dreadful noise about me, and had I not been in some measure familiar with such scenes, I should have felt sure that my last hour was at hand.

I was really uneasy, however: the scene was too frightful; but I never lost my presence of mind. At first I sat down on a stone that lay near, endeavoring to look as composed and confident as I could; but some rajahs then came up to me with very threatening looks and gestures, and gave me clearly to understand that if I did not turn back they would kill and eat me. Their words, indeed, I did not comprehend, but their action left no manner of doubt, for they pointed with their knives to my throat, and gnashed their teeth at my arm, moving their jaws then as if they already had them full of my flesh.

Of course, when I thought of coming among the wild Battakers, I had anticipated something of this sort, and I had therefore studied a little speech in their language for such an occasion. I knew if I could say anything that would amuse them, and perhaps make them laugh, I would have a great advantage over them, for savages are quite like children, and the merest trifle will often make them friends. I got up, therefore, and patting one of the most violent, who stood next me, upon the shoulder in a friendly manner, said, with smiling face, in a jargon half Malay and half Battaker, "Why, you don't mean to say you would kill and eat a woman, especially such an old one as I am! I must be very hard and tough!" And I also gave them by signs and words to understand that I was not at all afraid of them, and was ready, if they liked, to send back my guide, if they would only take me as far as the *Eier-Tau.*

Fortunately for me, the doubtless very odd way in which I pronounced their language, and my pantomime, diverted

them, and they began to laugh. Perhaps, also, the fearless confidence which I manifested made a good impression; they offered me their hands, the circle of spearmen opened, and, rejoicing not a little at having escaped this danger, I journeyed on, and reached in perfect safety a place called Tugala, where the rajah received me into his house.

BRAZILIAN ANTS AND MONKEYS.

HENRY W. BATES.

[The "Naturalist in the Amazons" of Henry Walter Bates is a work that has long held a deserved reputation for the closeness and accuracy of its observations and the interest of its narrative. The author, born at Leicester, England, in 1825, accompanied the noted biologist, Alfred Russel Wallace, to Brazil, the story of which journey is given in the work cited. From it we extract some passages concerning the animal life of that country, embracing the doings of the "leaf-cutting" ants and the monkeys. Our selections begin in the suburbs of Pará.]

In the gardens numbers of fine showy butterflies were seen. There were two swallow-tailed species, similar in colors to the English *Papilio machaon*, a white Pieris (*P. monuste*), and two or three species of brimstone- and orange-colored butterflies, which do not belong, however, to the same genus as our English species. In weedy places a beautiful butterfly with eye-like spots on its wings was common, the *Junonia lavinia*, the only Amazonian species which is at all nearly related to our Vanessas, the Admiral and Peacock butterflies.

One day we made our first acquaintance with two of the most beautiful productions of nature in this department,—namely, the *Helicopis cupido* and *endymion*. A little be-

yond our house one of the narrow green lanes which I have already mentioned diverged from the mongabu avenue, and led between enclosures overrun with a profusion of creeping plants and glorious flowers down to a moist hollow, where there was a public well and a picturesque nook, buried in a grove of mucajá palm-trees. On the tree-trunks, walls, and palings grew a great quantity of climbing Pothos plants, with large, glossy, heart-shaped leaves. These plants were the resort of these two exquisite species, and we captured a great number of specimens. They are of extremely delicate texture. The wings are cream-colored; the hind pair have several tail-like appendages, and are spangled beneath as if with silver. Their flight is very slow and feeble; they seek the protected under surface of the leaves, and in repose close their wings over the back, so as to expose the brilliantly spotted under surface.

I will pass over the many orders and families of insects, and proceed at once to the ants. These were in great numbers everywhere, but I will mention here only two kinds. We were amazed at seeing ants an inch and a quarter in length, and stout in proportion, marching in single file through the thickets. These belonged to the species called *Dinoponera grandis*. Its colonies consist of a small number of individuals, and are established about the roots of slender trees. It is a stinging species, but the sting is not so severe as in many of the smaller kinds. There was nothing peculiar or attractive in the habits of this giant among the ants. Another far more interesting species was the Saüba (*Œcodoma cephalotes*). This ant is seen everywhere about the suburbs, marching to and fro in broad columns. From its habit of despoiling the most valuable cultivated trees of their foliage, it is a great scourge to the Brazilians. In some districts it is so abun-

dant that agriculture is almost impossible, and everywhere complaints are heard of the terrible pest. . . .

In our first walks we were puzzled to account for large mounds of earth, of a different color from the surrounding soil, which were thrown up in the plantations and woods. Some of them were very extensive, being forty yards in circumference, but not more than two feet in height. We soon ascertained that these were the work of the Saübas, being the outworks or domes which overlie and protect the entrances to their vast subterranean galleries. On close examination I found the earth of which they are composed to consist of very minute granules, agglomerated with cement, and forming many rows of little ridges and turrets. The difference in color from the superficial soil of the vicinity is owing to their being formed of the undersoil, brought up from a considerable depth.

It is very rarely that the ants are seen at work on these mounds; the entrances seem to be generally closed; only now and then, when some particular work is going on, are the galleries opened. The entrances are small and numerous; in the larger hillocks it would require a great amount of excavation to get at the main galleries; but I succeeded in removing portions of the dome in smaller hillocks, and then I found that the minor entrances converged, at the depth of about two feet, to one broad, elaborately worked gallery or mine, which was four or five inches in diameter.

The habit in the Saüba ant of clipping and carrying away immense quantities of leaves has long been recorded in books on natural history. When employed on this work their processions look like a multitude of animated leaves on the march. In some places I found an accumulation of such leaves, all circular pieces, about the size of a sixpence, lying on the pathway, unattended by ants, and at some distance from the colony. Such heaps are always found

to be removed when the place is revisited the next day. In course of time I had plenty of opportunities of seeing them at work. They mount the trees in multitudes, the individuals being all worker-miners. Each one places itself on the surface of a leaf, and cuts with its sharp, scissor-like jaws, and by a sharp jerk detaches the piece. Sometimes they let the leaf drop to the ground, where a little heap accumulates until carried away by another relay of workers; but generally each marches off with the piece it has operated upon, and, as all take the same road to their colony, the path they follow becomes in a short time smooth and bare, looking like the impression of a cart-wheel through the herbage.

It is a most interesting sight to see the vast host of busy diminutive laborers occupied on this work. Unfortunately, they choose cultivated trees for their purpose. This ant is quite peculiar to tropical America, as is the entire genus to which it belongs. It sometimes despoils the young trees of species growing wild in its native forests; but it seems to prefer, when within reach, plants imported from other countries, such as the coffee- and orange-trees. . . . The heavily-laden workers, each carrying its segment of leaf vertically, the lower edge secured in its mandibles, troop up and cast their burdens on the hillock; another relay of laborers place the leaves in position, covering them with a layer of earthy granules, which are brought one by one from the soil beneath.

The underground abodes of this wonderful ant are known to be very extensive. The Rev. Hamlet Clark has related that the Saüba of Rio de Janeiro, a species closely allied to ours, has excavated a tunnel under the bed of the river Parahyba at a place where it is as broad as the Thames at London Bridge. At the Magoary rice-mills, near Pará, these ants once pierced the embankment of a

large reservoir; the great body of water which it contained escaped before the damage could be repaired. In the Botanic Gardens at Pará an enterprisng French gardener tried all he could think of to extirpate the Saüba. With this object he made fires over some of the main entrances to their colonies, and blew the fumes of sulphur down the galleries by means of bellows. I saw the smoke issue from a great number of outlets, one of which was seventy yards distant from the place where the bellows were used. This shows how extensively the underground galleries are ramified.

Besides injuring and destroying young trees by despoiling them of their foliage, the Saüba ant is troublesome to the inhabitants from its habit of plundering the stores of provisions in houses at night, for it is even more active at night than in the daytime. At first I was inclined to discredit the stories of their entering habitations and carrying off grain by grain the farinha or mandioca meal, the bread of the poorer classes of Brazil. At length, while residing at an Indian village on the Tapajos, I had ample proof of the fact. One night my servant woke me three or four times before sunrise by calling out that the rats were robbing the farinha baskets. The article at that time was scarce and dear. I got up, listened, and found the noise very unlike that made by rats. So I took the light and went into the store-room, which was close to my sleeping-place. I there found a broad column of Saüba ants, consisting of thousands of individuals, as busy as possible, passing to and fro between the door and my precious baskets. Most of those passing outward were laden each with a grain of farinha, which was, in some cases, larger and many times heavier than the bodies of the carriers.

Farinha consists of grains of similar size and appearance to the tapioca of our shops; both are products of the same

root, tapioca being the pure starch, and farinha the starch mixed with woody fibre, the latter ingredient giving it a yellowish color. It was amusing to see some of the dwarfs, the smallest members of their family, staggering along, completely hidden under their load. The baskets, which were on a high table, were entirely covered with ants, many hundreds of whom were employed in snipping the dry leaves which served as lining. This produced the rustling sound which had at first disturbed us. My servant told me that they would carry off the whole contents of the two baskets (about two bushels) in the course of the night if they were not driven off, so we tried to exterminate them by killing them with our wooden clogs. It was impossible, however, to prevent fresh hosts coming in as fast as we killed their companions. They returned the next night, and I was then obliged to lay trains of gunpowder along their line and blow them up. This, repeated many times, at last seemed to intimidate them, for we were free from their visits during the remainder of my residence at the place.

What they did with the hard dry grains of mandioca I was never able to ascertain, and cannot even conjecture. The meal contains no gluten, and therefore would be useless as cement. It contains only a small relative portion of starch, and, when mixed with water, it separates and falls away like so much earthy matter. It may serve as food for the subterranean workers. But the young or larvæ of ants are usually fed by juices secreted by the worker-nurses.

[Leaving the ants with this example of their curious habits, we shall proceed with the author's description of Brazilian monkeys.]

I have already mentioned that monkeys were rare in the immediate vicinity of Pará. I met with three species

only in the forest near the city; they are shy animals and avoid the neighborhood of towns, where they are subject to much persecution by the inhabitants, who kill them for food. The only kind which I saw frequently was the little *Midas ursulus*, one of the Marmosets, a family peculiar to tropical America, and differing in many essential points of structure and habits from all other apes. They are small in size, and more like squirrels than true monkeys in their manner of climbing. The nails, except those of the hind thumbs, are long and claw-shaped like those of squirrels, and the thumbs of the fore extremities, or hands, are not opposable to the other fingers. I do not mean to convey that they have a near relationship to squirrels, which belong to the Rodents, an inferior order of mammals; their resemblance to those animals is merely a superficial one. They have two molar teeth less in each jaw than the Cebidæ, the other family of American monkeys; they agree with them, however, in the sideway position of the nostrils, a character which distinguishes both from all the monkeys of the Old World. The body is long and slender, clothed with soft hairs, and the tail, which is nearly twice the length of the trunk, is not prehensile. The hind limbs are much larger in volume than the anterior pair.

The *Midas ursulus* is never seen in large flocks; three or four is the greatest number observed together. It seems to be less afraid of the neighborhood of man than any other monkey. I sometimes saw it in the woods which border the suburban streets, and once I espied two individuals in a thicket behind the English consul's house at Nazareth. Its mode of progression along the main boughs of the lofty trees is like that of squirrels; it does not ascend to the slender branches, or take those wonderful flying leaps which the Cebidæ do, whose prehensile tails and flexible hands fit them for such headlong travelling.

It confines itself to the larger boughs and trunks of trees, the long nails being of great assistance to the creature, enabling it to cling securely to the bark; and it is often seen passing rapidly round the perpendicular cylindrical trunks. It is a quick, restless, timid little creature, and has a great share of curiosity, for when a person passes by under the trees along which a flock is running, they always stop for a few moments to have a stare at the intruder.

In Pará *Midas ursulus* is often seen in a tame state in the houses of the inhabitants. When full grown it is about nine inches long, independently of the tail, which measures fifteen inches. The fur is thick, and black in color, with the exception of a reddish-brown streak down the middle of the back. When first taken, or when kept tied up, it is very timid and irritable. It will not allow itself to be approached, but keeps retreating backward when any one attempts to coax it. It is always in a querulous humor, uttering a twittering, complaining noise; its dark, watchful eyes, expressive of distrust, observant of every movement which takes place near it. When treated kindly, however, as it generally is in the houses of the natives, it becomes very tame and familiar. I once saw one as playful as a kitten, running about the house after the negro children, who fondled it to their hearts' content. It acted somewhat differently towards strangers, and seemed not to like them to sit in the hammock which was slung in the room, leaping up, trying to bite, and otherwise annoying them.

It is generally fed on sweet fruits, such as the banana, but it is also fond of insects, especially soft-bodied spiders and grasshoppers, which it will snap up with eagerness when within reach. The expression of countenance in these small monkeys is intelligent and pleasing. This is partly owing to the open facial angle, which is given as one of sixty degrees; but the quick movements of the head, and

the way they have of inclining it to one side when their curiosity is excited, contribute very much to give them a knowing expression. Anatomists who have dissected species of Midas tell us that the brain is of a very low type as far as the absence of convolutions goes, the surface being as smooth as that of a squirrel's. I should conclude at once that this character is an unsafe guide in judging of the mental qualities of these animals; in mobility of expression of countenance, intelligence, and general manners these small monkeys resemble the higher apes far more than they do any rodent animal with which I am acquainted.

On the upper Amazon I once saw a tame individual of the *Midas leoninus*, a species first described by Humboldt, which was still more playful and intelligent than the one just described. This rare and beautiful little monkey is only seven inches in length, exclusive of the tail. It is named leoninus on account of the long brown mane which depends from the neck, and which gives it very much the appearance of a diminutive lion. In the house where it was kept it was familiar with every one; its greatest pleasure seemed to be to climb about the bodies of different persons who entered. The first time I went in, it ran across the room straightway to the chair on which I sat down and climbed up to my shoulder; arrived there, it turned round and looked into my face, showing its little teeth, and chattering, as though it would say, "Well, and how do you do?" It showed more affection towards its master than towards strangers, and would climb up to his head a dozen times in the course of an hour, making a great show every time of searching there for certain animalcula.

Isidore Geoffroy St. Hilaire relates of a species of this genus that it distinguished between different objects de-

picted on an engraving. M. Audouin showed it the portraits of a cat and a wasp; at these it became much terrified; whereas at the sight of a figure of a grasshopper or beetle it precipitated itself on the picture, as if to seize the objects there represented.

Although monkeys are now rare in a wild state near Pará, a great number may be seen semi-domesticated in the city. The Brazilians are fond of pet animals. Monkeys, however, have not been known to breed in captivity in this country. I counted in a short time thirteen different species while walking about the Pará streets, either at the doors or windows of houses, or in the native canoes. Two of them I did not meet with afterwards in any other part of the country. One of these was the well-known *Hapale jacchus*, a little creature resembling a kitten, banded with black and gray all over the body and tail, and having a fringe of long white hairs surrounding the ears. It was seated on the shoulder of a young mulatto girl, as she was walking along the street, and I was told had been captured in the island of Marajo. The other was a species of Cebus, with a remarkably large head. It had ruddy brown fur, paler on the face, but presenting a blackish tuft on the top of the forehead. . . .

The only monkeys I observed at Cametá were the Couxio (*Pithecia satanas*), a large species, clothed with long brownish black hair, and the tiny *Midas argentatus*. The Couxio has a thick bushy tail; the hair of the head sits on it like a cap, and looks as if it had been carefully combed. It inhabits only the most retired parts of the forest, on the terra firma, and I observed nothing of its habits. The little *Midas argentatus* is one of the rarest of the American monkeys. I have not heard of its being found anywhere except near Cametá. I once saw three individuals together running along a branch in a cacao grove near Cametá;

they looked like white kittens: in their motions they resembled precisely the *Midas ursulus* already described.

I saw afterwards a pet animal of this species, and heard that there were many so kept, and that they were esteemed as choice treasures. The one I saw was full grown, but it measured only seven inches in length of body. It was covered with long white, silky hairs, the tail was blackish, and the face nearly naked and flesh-colored. It was a most timid and sensitive little thing. The woman who owned it carried it constantly in her bosom, and no money would induce her to part with her pet. She called it Mico. It fed from her mouth and allowed her to fondle it freely, but the nervous little creature would not permit strangers to touch it. If any one attempted to do so it shrank back, the whole body trembling with fear, and its teeth chattered, while it uttered its tremulous frightened tones. The expression of its features was like that of its more robust brother *Midas ursulus;* the eyes, which were black, were full of curiosity and mistrust, and it always kept them fixed on the person who attempted to advance towards it.

In the orange groves and other parts humming-birds were plentiful, but I did not notice more than three species. I saw a little pigmy belonging to the genus Phæthornis one day in the act of washing itself in a brook. It was perched on a thin branch, whose end was under water. It dipped itself, then fluttered its wings and pruned its feathers, and seemed thoroughly to enjoy itself alone in the shady nook which it had chosen,—a place overshadowed by broad leaves of ferns and Heliconiæ. I thought as I watched it that there was no need for poets to invent elves and gnomes while nature furnishes us with such marvellous little sprites ready to hand.

THE MONARCHS OF THE ANDES.

JAMES ORTON.

[The story of the Andes and the great river to which this mountain-chain gives birth has never been better told than in Orton's "The Andes and the Amazon," from which we select the following description of Chimborazo and its mountain neighbors. James Orton, born at Seneca Falls, New York, in 1830, became a Congregationalist clergyman, and in 1867 headed an exploring expedition to South America. In 1873 he sought that continent again, and died on Lake Titicaca, September 24, 1877.]

COMING up from Peru through the cinchona forests of Loja, and over the barren hills of Assuay, the traveller reaches Riobamba seated on the threshold of magnificence, —like Damascus, an oasis in a sandy plain, but, unlike the Queen of the East, surrounded with a splendid retinue of snowy peaks that look like icebergs floating in a sea of clouds.

On our left is the most sublime spectacle in the New World. It is a majestic pile of snow, its clear outline on the deep blue sky describing the profile of a lion in repose. At noon the vertical sun, and the profusion of light reflected from the glittering surface, will not allow a shadow to be cast on any part, so that you can easily fancy the figure is cut out of a mountain of spotless marble. This is Chimborazo,—yet not the whole of it,—you see but a third of the great giant. His feet are as eternally green as his head is everlastingly white; but they are far away beneath the banana and cocoanut palms of the Pacific coast.

Rousseau was disappointed when he first saw the sea; and the first glimpse of Niagara often fails to meet one's expectations. But Chimborazo is sure of a worshipper the

moment its overwhelming grandeur breaks upon the traveller. You feel that you are in the presence-chamber of the monarch of the Andes. There is sublimity in his kingly look of which the ocean might be proud.

"All that expands the spirit, yet appeals,
Gathers around this summit, as if to show
How earth may pierce to heaven, yet leave vain man below."

Well do we remember our disappointment as we stood before that wonder of the world,—St. Peter's. We mounted the pyramid of steps and looked up, but were not overcome by the magnificence. We read in our guide-book that the edifice covers eight acres, and to the tip-top of the cross is almost five hundred feet; that it took three hundred and fifty years and twelve successive artists to finish it and an expenditure of fifty million dollars, and now costs thirty thousand dollars per annum to keep it in repair, still we do not appreciate its greatness. We pushed aside the curtain and walked in,—walked a day's journey across the transept and up and down the everlasting nave, and yet continued heterodox. We tried hard to believe it was very vast and sublime, and we knew we ought to feel its grandeur, but somehow we did not. Then we sat down by the Holy of Holies, and there we were startled into a better judgment by the astounding fact that the Cathedral of St. Paul—the largest edifice in Great Britain—could stand upright, spire, dome, body, and all, inside of St. Peter's! that the letters of the inscription which run round the *base* of the dome, though apparently but an inch, are in reality six feet high! Then for the first time the scales fell from our eyes, the giant building began to grow; higher and higher still it rose, longer and deeper it expanded, yet in perfect proportions; the colossal structure, now a living temple, put on its beautiful garments and the robe of majesty. And that

dome! the longer we looked at it the vaster it grew, till finally it seemed to be a temple not made with hands; the spacious canopy became the firmament; the mosaic figures of cherubim and seraphim were endowed with life; and as we fixed our eyes on the zenith where the Almighty is represented in glory, we thought we had the vision of Stephen. Long we gazed upward into this heaven of man's creation, and gazed again till we were lost in wonder.

But the traveller needs no such steps to lift him up to the grand conception of the divine Architect as he beholds the great white dome of Chimborazo. It looks lofty from the very first. Now and then an expanse of thin, sky-like vapor would cut the mountain in twain, and the dome, islanded in the deep blue of the upper regions, seemed to belong more to heaven than to earth. We knew that Chimborazo was more than twice the altitude of Etna. We could almost see the great Humboldt struggling up the mountain's side till he looked like a black speck moving over the mighty white, but giving up in despair four thousand feet below the summit. We see the intrepid Bolivar mounting still higher; but the hero of Spanish-American independence returns a defeated man. Last of all comes the philosophic Boussingault, and attains the prodigious elevation of nineteen thousand six hundred feet,—the highest point reached by man without the aid of a balloon; but the dome remains unsullied by his foot. Yet none of these facts increase our admiration. The mountain has a tongue which speaks louder than all mathematical calculations.

There must be something singularly sublime about Chimborazo, for the spectator at Riobamba is already nine thousand feet high, and the mountain is not so elevated above him as Mont Blanc above the vale of Chamouni, when, in reality, that culminating point of Europe would not reach up even to the snow-limit of Chimborazo by two thousand

feet. It is only while sailing on the Pacific that one sees Chimborazo in its complete proportions. Its very magnificence diminishes the impression of awe and wonder, for the Andes on which it rests are heaved to such a vast altitude above the sea, that the relative elevation of its summit becomes reduced by comparison with the surrounding mountains. Its altitude is twenty-one thousand four hundred and twenty feet, or forty-five times the height of Strasburg cathedral; or, to state it otherwise, the fall of one pound from the top of Chimborazo would raise the temperature of water thirty degrees. One-fourth of this is perpetually covered with snow, so that its ancient name Chimpurazu—the mountain of snow—is very appropriate. It is a stirring thought that this mountain, now mantled with snow, once gleamed with volcanic fires. There is a hot spring on the north side, and an immense amount of débris covers the slope below the snow-limit, consisting chiefly of fine-grained, iron-stained trachyte and coarse porphyroid gray trachyte; very rarely a dark vitreous trachyte. Chimborazo is very likely not a solid mountain; trachytic volcanoes are supposed to be full of cavities. Bouger found it made the plumb line deviate 7″ or 8″.

The valleys which furrow the flank of Chimborazo are in keeping with its colossal size. Narrower, but deeper, than those of the Alps, the mind swoons and sinks in the effort to comprehend their grim majesty. The mountain appears to have been broken to pieces like so much thin crust, and the strata thrown on their vertical edges, revealing deep, dark chasms, that seem to lead to the confines of the lower world. The deepest valley in Europe, that of the Ordesa in the Pyrenees, is three thousand two hundred feet deep; but here are rents in the side of Chimborazo in which Vesuvius could be put away out of sight. As you look down into the fathomless fissure, you see a white fleck

rising out of the gulf, and expanding as it mounts, till the wings of the condor, fifteen feet in spread, glitter in the sun as the proud bird fearlessly wheels over the dizzy chasm, and then, ascending above your head, sails over the dome of Chimborazo. Could the condor speak, what a glowing description he could give of the landscape beneath him when his horizon is a thousand miles in diameter! If

"Twelve fair counties saw the blaze from Malvern's lonely height,"

what must be the panorama from a height fifteen times higher!

Chimborazo was long supposed to be the tallest mountain on the globe, but its supremacy has been supplanted by Mount Everest in Asia, and Aconcagua in Chile. In mountain gloom and glory, however, it still stands unrivalled. The Alps have the avalanche, "the thunderbolt of snow," and the glaciers, those icy Niagaras so beautiful and grand. Here they are wanting. The monarch of the Andes sits motionless in calm serenity and unbroken silence. The silence is absolute and actually oppressive. The road from Guayaquil to Quito crosses Chimborazo at the elevation of fourteen thousand feet. Save the rush of the trade wind in the afternoon, as it sweeps over the Andes, not a sound is audible; not the hum of an insect, nor the chirp of a bird, nor the roar of the puma, nor the music of running waters. Mid-ocean is never so silent. You can almost hear the globe turning on its axis. There was a time when the monarch deigned to speak, and spoke with a voice of thunder, for the lava on its sides is an evidence of volcanic activity. But ever since the morning stars sang together over man's creation Chimbo has sat in sullen silence, satisfied to look "from his throne of clouds o'er half the world." There is something very suggestive in this silence of Chimborazo. It was once full of noise

and fury; it is now a *completed* mountain, and thunders no more. How silent was Jesus, a completed character! The reason that we are so noisy is that we are so full of wants; we are *unfinished* characters. Had we perfect fulness of all things, the beatitude of being without a want, we should lapse into the eternal silence of God.

Chimborazo is a leader of a long train of ambitious crags and peaks; but as he who comes after the king must not expect to be noticed, we will only take a glimpse of these lesser lights as we pass up the Western Cordillera, and then down the Eastern.

The first after leaving the monarch is Caraguairazo. The Indians call it "the wife of Chimborazo." They are separated only by a very narrow valley. One hundred and seventy years ago the top of this mountain fell in, and torrents of mud flowed out containing multitudes of fishes. It is now over seventeen thousand feet high, and is one of the most Alpine of the Quitonian volcanoes, having sharp pinnacles instead of the smooth trachytic domes—usually double domes—so characteristic of the Andean summits. And now we pass in rapid succession numerous picturesque mountains, some of them extinct volcanoes, as Iliniza, presenting two pyramidal peaks, the highest seventeen thousand feet above the sea, and Corazon, so named from its heart-shaped summit, till we reach Pichincha, whose smoking crater is only five miles distant in a straight line from the city of Quito, or eleven by the travelled route.

The crown of this mountain presents three groups of rocky peaks. The most westerly one is called Rucu-Pichincha, and alone manifests activity. To the northeast of Rucu is Guagua-Pichincha, a ruined flue of the same fiery furnace; and between the two is Cundur-Guachana. Pichincha is the only volcano in Ecuador which has not a true cone crater. Some violent eruption beyond the reach of history or tradi-

tion has formed an enormous funnel-shaped basin two thousand five hundred feet deep, fifteen hundred in diameter at the bottom, and expanding upward to a width of three-fourths of a mile. It is the *deepest* crater on the globe. That of Kilauea is six hundred feet; Orizaba, five hundred; Etna, three hundred; Hecla, one hundred. Vesuvius is a portable furnace in comparison. The abyss is girt with a ragged wall of dark trachyte, which rises on the inside at various angles between forty-five degrees and perpendicularity. As we know of but one American besides the members of our expedition (Mr. Farrand, a photographer) who has succeeded in entering the crater of this interesting volcano, we will give a brief sketch of our visit.

Leaving Quito in the afternoon by the old arched gateway at the foot of Panecillo, and crossing a spur of the mountain, we stopped for the night at the Jesuit hacienda, situated in the beautiful valley of Lloa, but nearly ruined by the earthquake of 1859. On the damp walls of this monastery, perched ten thousand two hundred and sixty-eight feet above the ocean, we found several old paintings, among them a copy of the *Visitation* by Rubens. The sunset views in this heart of the Andes were surpassingly beautiful. Mounting our horses at break of day, and taking an Indian guide, we ascended rapidly by a narrow and difficult path through the forest that belts the volcano up to the height of twelve thousand feet, emerging gradually into a thicket of stunted bushes, and then entered the dreary *paramo*. Splendid was the view of the Eastern Cordillera. At least six dazzling white volcanoes were in sight just across the valley of Quito, among them table-topped Cayambi, majestic Antisana, and princely Cotopaxi, whose tapering summit is a mile above the clouds. Toiling upward we reached the base of the cone where vegetation ceased entirely; and tying our horses to some huge rocks

that had fallen from the mural cliff above, we started off on hands and feet for the crater. The cone is deeply covered with sand and cinders for about two hundred feet, and the sides are inclined at an angle of about thirty-five degrees. At ten o'clock we reached the brim of the crater, and the great gulf burst suddenly into view.

We can never forget the impression made upon us by the sight. We speak of many things here below as awful, but that word has its full meaning when carried to the top of Pichincha. There you see a frightful opening in the earth's crust nearly a mile in width and half a mile deep, and from the dark abyss comes rolling up a cloud of sulphurous vapors. Monte Somma in the time of Strabo was a miniature; but this crater is on the top of a mountain four times the height of the Italian volcano. Imagination finds it difficult to conceive a spectacle of more fearful grandeur or such solemn magnificence. It well accords with Milton's picture of the bottomless pit. The united effect of the silence and solitude of the place, the great depth of the cavity, the dark precipitous sides, and the column of smoke standing over an unseen crevice, was to us more impressive than thundering Cotopaxi or fiery Vesuvius. Humboldt, after standing on this same brink, exclaimed, "I have never beheld a grander or more remarkable picture than that presented by this volcano;" and La Condamine compared it to "the Chaos of the poets."

Below us are the smouldering fires which may any moment spring forth into a conflagration; around us are black, ragged cliffs,—fit boundary for this gate-way to the infernal regions. They look as if they had just been dragged up from the central furnace of the earth. Life seems to have fled in terror from the vicinity; even lichens, the children of the bare rocks, refuse to clothe the scathed and beetling crags. For some moments made mute by the

dreadful sight, we stood like statues on the rim of the mighty caldron, with our eyes riveted on the abyss below, lost in contemplating that which cannot be described. The panorama from this lofty summit is more pleasing, but equally sublime. Towards the rising sun is the long range of the Eastern Cordillera, hiding from our view the great valley of the Amazon. To right and left are the peaks of another procession of august mountains from Cotocachi to Chimborazo. We are surrounded by the great patriarchs of the Andes, and their speaker, Cotopaxi, ever and anon sends his muttering voice over the land.

The view westward is like looking down from a balloon. Those parallel ridges of the mountain chain, dropping one behind the other, are the gigantic staircase by which the ice-crowned Chimborazo steps down to the sea. A white sea of clouds covers the peaceful Pacific and the lower parts of the coast. But the vapory ocean, curling into the ravines, beautifully represents little coves and bays, leaving islands and promontories like a true ocean on a broken shore. We seem raised above the earth, which lies like an opened map below us; we can look down on the upper surface of the clouds, and, were it night, down too upon the lightnings. . . .

The first to reach the brink of the crater were the French Academicians in 1742. Sixty years after Humboldt stood on the summit. But it was not until 1844 that any one dared to enter the crater. This was accomplished by Garcia Moreno, now President of Ecuador, and Sebastian Wisse, a French engineer. Humboldt pronounced the bottom of the crater "inaccessible from its great depth and precipitous descent." We found it accessible, but exceedingly perilous. The moment we prepared to descend our guide ran away. We went on without him, but when halfway down were stopped by a precipice.

On the 22d of October, 1867, we returned to Pichincha with another guide and entered the crater by a different route. Manuel, our Indian, led us to the south side, and over the brink we went. We were not long in realizing the danger of the undertaking. Here the snow concealed an ugly fissure or covered a treacherous rock (for nearly all the rocks are crumbling), there we must cross a mass of loose sand moving like a glacier down the almost vertical side of the crater; and on every hand rocks were giving way, and, gathering momentum at each revolution, went thundering down, leaping over precipices and jostling other rocks, which joined in the race, till they all struck the bottom with a deep rumbling sound, shivered like so many bomb-shells into a thousand pieces, and telling us what would be our fate if we made a single misstep. We followed our Indian in single file, keeping close together, that the stones set free by those in the rear might not dash those below from their feet; feeling our way with the greatest caution, clinging with our hands to the snow, sand, rocks, tufts of grass, or anything that would hold for a moment; now leaping over a chasm, now letting ourselves down from rock to rock; at times paralyzed with fear, and always with death staring us in the face; thus we scrambled for two hours and a half till we reached the bottom of the crater.

Here we found a deeply furrowed plain strewn with ragged rocks, and containing a few patches of vegetation, with half a dozen species of flowers. In the centre is an irregular heap of stones, two hundred and sixty feet high by eight hundred in diameter. This is the cone of eruption, —its sides and summit covered with an imposing group of vents, seventy in number, all lined with sulphur and exhaling steam, black smoke, and sulphurous gas. The temperature of the vapor just within the fumarole is 184°, water boiling beside it at 189°.

The central vent or chimney gives forth a sound like the violent bubbling of boiling water. As we sat on this fiery mount surrounded by a circular rampart of rocks, and looked up at the immense towers of dark dolerite which ran up almost vertically to the height of twenty-five hundred feet above us, musing over the tremendous force which fashioned this awful amphitheatre,—spacious enough for all the gods of Tartarus to hold high carnival,—the clouds which hung in the thin air around the crest of the crater pealed forth thunder after thunder, which, reverberating from precipice to precipice, were answered by the crash of rocks let loose by the storm, till the whole mountain seemed to tremble like a leaf. Such acoustics, mingled with the flash of lightning and the smell of brimstone, made us believe that we had fairly got into the realm of Pluto. It is the spot where Dante's "Inferno" ought to be read.

INCA HIGH-ROADS AND BRIDGES.

E. GEORGE SQUIER.

[Squier's "Peru: Incidents of Travel and Exploration in the Land of the Incas" is the source of our present selection. The author, Ephraim George Squier, was born in Albany County, New York, in 1821. He studied the aboriginal monuments of New York, and afterwards travelled and made extensive archæological researches in Central America. He was appointed United States Commissioner to Peru in 1863, and made important studies of the ancient ruins of that country. We give his interesting account of the perilous crossing of the Apurimac.]

THE great and elaborate highways, or public roads, which the chroniclers and the historians, following their

authority, tell us were constructed by the Incas throughout their vast empire, all radiating north, east, south, and west from the imperial city of Cuzco, if they existed at all in Central and Southern Peru, have disappeared, leaving here and there only short sections or fragments, hardly justifying the extravagant praise that has been bestowed on them. The modern mule-paths, miscalled roads, must necessarily follow nearly, if not exactly, the routes of the Indians under the Empire. The physical conformation of the country is such that communication between *puna* and *puna*, and from valley to valley, must always be made by the same passes. All these passes over the mountains are marked by huge piles of stone raised, like the cairns of Scotland and Wales, by the contribution of a single stone from each traveller as an offering to the spirits of the mountains, and as an invocation for their aid in sustaining the fatigues of travel. These great stone-heaps still exist, and will remain to the end of time, monuments marking forever the routes of travel in the days of the Incas.

We know, therefore, from these rude monuments very nearly what were the ancient lines of communication. These are also further indicated by remains of the *tambos*, which occur at intervals all through the country, and oftenest in places remote from supplies, in cold and desert districts, where the traveller stands most in need of food and shelter.

The modern voyager would consider himself supremely fortunate were he to find one in a hundred of these tambos, now in existence; for travelling in Peru is infinitely more difficult and dangerous than it was in the days of the Incas: more difficult, because the facilities are less; more dangerous, because the laws are more lax, and the moral standard of the people lower. The influence of Spain in Peru has

been every way deleterious; the civilization of the country was far higher before the Conquest than now.

As I have said, few traces of the Inca roads, such as are described by the early writers, and such as Humboldt saw in Northern Peru, are now to be found in the southern part of that country; and as the modern pathways must follow the ancient lines, I infer that they never existed here, for there is no reason why they should have suffered more from time and the elements in one part of the country than in another.

Between Cuzco and the sweet valley of Yucay there are numerous traces of an ancient road, some sections of which are perfect. These sections coincide in character with the long reaches in the direction of Quito. They consist of a pathway from ten to twelve feet wide, raised slightly in the centre, paved with stones, and the edges defined by larger stones sunk firmly in the ground. Where this road descends from the elevated *puna*—a sheer descent of almost four thousand feet into the valley of Yucay—it zigzags on a narrow shelf cut in the face of the declivity, and supported here and there, where foothold could not otherwise be obtained, by high retaining-walls of cut stone, looking as perfect and firm as when first built centuries ago.

High mountain-ranges and broad and frigid deserts, swept by fierce, cold winds, are not the sole obstacles to intercommunication in the Altos of Peru, and among those snow-crowned monarchs of the Andes and Cordilleras. There are deep valleys, gorges, and ravines among the mountains, or cut deep in the plains that alternate with them, in which flow swelling rivers or rapid torrents, fed by the melting snows in the dry season, and swollen by the rains in the wet season. They are often unfordable, but still they must somehow be passed by the traveller. A

few bridges of stone were constructed by the Spaniards, some after the Conquest, and a few others have been erected by their descendants; but, as a rule, the rivers and mountain-torrents are passed to-day by the aid of devices the same as were resorted to by the Incas, and at points which they selected.

Had the principle of the arch been well understood by the ancient inhabitants, who have left some of the finest stone-cutting and masonry to be found in the world, there is no doubt the interior of Peru would have abounded in bridges rivalling those of Rome in extent and beauty. As it was, occupying a country destitute of timber, they resorted to suspension-bridges, no doubt precisely like those now constructed by their descendants and successors,—bridges formed of cables of braided withes, stretched from bank to bank, and called *puentes de mimbres* (bridges of withes). Where the banks are high, or where the streams are compressed between steep or precipitous rocks, these cables are anchored to piers of stone. In other places they are approached by inclined causeways, raised to give them the necessary elevation above the water. Three or four cables form the floor and the principal support of the bridge, over which small sticks, sometimes only sections of cane or bamboo, are laid transversely, and fastened to the cables by vines, cords, or thongs of raw hide. Two smaller cables are sometimes stretched on each side as a guard or hand-rail. Over these frail and swaying structures pass men and animals, the latter frequently with their load on their backs.

Each bridge is usually kept up by the municipality of the nearest village; and as it requires renewal every two or three years, the Indians are obliged at stated periods to bring to the spot a certain number of withes of peculiar kinds of tough wood, generally of that variety called ioke,

which are braided by experts, and then stretched across the stream or river by the united exertions of the inhabitants. Some of the larger and most important structures of this kind are kept up by the government, and all passengers and merchandise pay a fixed toll. Such is the case with the great bridge over the Apurimac, on the main road from the ancient Guamanga (now Ayacucho) to Cuzco.

The Apurimac is one of the head-waters of the Amazon, a large and rapid stream, flowing in a deep valley, or rather gigantic ravine, shut in by high and precipitous mountains. Throughout its length it is crossed at only a single point, between two enormous cliffs, which rise dizzily on both sides, and from the summits of which the traveller looks down into a dark gulf. At the bottom gleams a white line of water, whence struggles up a dull but heavy roar, giving to the river its name, *Apu-rimac* signifying, in the Quichua tongue, "the great speaker." From above, the bridge, looking like a mere thread, is reached by a path which on one side traces a thin, white line on the face of the mountain, and down which the boldest traveller may hesitate to venture. This path, on the other side, at once disappears from a rocky shelf, where there is just room enough to hold the hut of the bridge-keeper, and then runs through a dark tunnel cut in the rock, from which it emerges to trace its line of many a steep and weary zigzag of the face of the mountain. It is usual for the traveller to time his day's journey so as to reach this bridge in the morning, before the strong wind sets in; for during the greater part of the day it sweeps up the cañon of the Apurimac with great force, and then the bridge sways like a gigantic hammock, and crossing is next to impossible.

It was a memorable incident in my travelling experi-

ences, the crossing of this great swinging bridge of the Apurimac. I shall never forget it, even if it were not associated with a circumstance which, for the time, gave me much uneasiness and pain. The fame of the bridge over the Apurimac is coextensive with Peru, and every one we met who had crossed it was full of frightful reminiscences of his passage: how the frail structure swayed at a dizzy height between gigantic cliffs over a dark abyss, filled with the deep, hoarse roar of the river, and how his eyes grew dim, his heart grew faint, and his feet unsteady as he struggled across it, not daring to cast a look on either hand.

Our road to the bridge was circuitous and precipitous, leading down the steeper side of the ridge of La Banca, where it seemed hardly possible for a goat to find foothold. It was a succession of abrupt zigzags, here and there interrupted by a stretch of horizontal pathway. To see our cavalcade it was necessary to look up or down, not before or behind. It was like descending the coils of a flattened corkscrew. In places the rocks encroached on the trail so that it was necessary to crouch low on the saddle-bow to pass beneath them, or else throw the weight of the body on the stirrup overhanging the declivity of the mountain, to avoid a collision. The most dangerous parts, however, were where land-slips had occurred, and where it was impossible to construct a pathway not liable at any moment to glide away beneath the feet of our animals. The gorge narrowed as we descended, until it was literally shut in by precipices of stratified rock strangely contorted; while huge masses of stone, rent and splintered as from some terrible convulsion of nature, rose sheer before us, apparently preventing all exit from the sunless and threatening ravine, at the bottom of which a considerable stream struggled, with a hoarse roar, among the black boulders.

There was foothold for neither tree nor shrub, and our mules picked their way warily, with head and ears pointed downward, among the broken and angular masses. The occasional shouts of the arrieros sounded here sharp and percussive, and seemed to smite themselves to death against the adamantine walls. There was no room for echo. Finally the ravine became so narrowed between the precipitous mountain-sides as barely to afford room for the stream and our scant party. Here a roar, deeper, stronger, and sterner than that of the stream which we had followed, reached our ears, and we knew it was the voice of the "Great Speaker." A little farther on we came in view of the river and two or three low huts built on the circumscribed space where the two streams came close together. Our muleteers were already busy in unloading the baggage, preparatory to its being carried across the bridge on the cicatrized backs of the occupants of the huts.

To the left of the huts, swinging high in a graceful curve, between the precipices on either side, looking wonderfully frail and gossamer-like, was the famed bridge of the Apurimac. A steep, narrow path, following for some distance a natural shelf, formed by the stratification of the rock, and for the rest of the way hewn in its face, led up, for a hundred feet, to a little platform, also cut in the rock, where were fastened the cables supporting the bridge. On the opposite bank was another and rather larger platform, partly roofed by the rock, where was the windlass for making the cables taut, and where, perched like goats on some mountain-shelf, lived the custodians of the bridge. The path could barely be discovered turning sharp around a rocky projection to the left of this perch, then reappearing high above it, and then, after many a zigzag, losing itself in the dark mouth of a tunnel.

My companions and myself lost no time in extracting

the measuring tapes and sounding lines from our *alforjas*, and hurriedly scrambled up the rocky pathway to the bridge. It was in bad condition. The cables had slacked so that the centre of the bridge hung from twelve to fifteen feet lower than its ends, and, then, the cables had not stretched evenly, so that one side was considerably lower than the other. The cables on either hand, intended to answer the double purpose of stays and parapets, had not sunk with the bridge, and were so high up that they could not be reached without difficulty; and many of the lines dropping from them to the floor, originally placed widely apart, had been broken, so that practically they were useful neither for security nor for inspiring confidence.

Travelling in the Andes soon cures one of any nervousness about heights and depths, and is a specific against dizziness. Nevertheless, we all gave a rather apprehensive glance at the frail structure before us, but we had no difficulty in crossing and recrossing—as we did several times—except on approaching the ends, to which our weight transferred the sag of the cables and made the last few yards rather steep. A stiff breeze swept up the cañon of the river, and caused a vibration of the bridge from side to side of at least six feet. The motion, however, inspired no sense of danger.

We carefully measured the length and altitude of the bridge, and found it to be from fastening to fastening one hundred and forty-eight feet long, and at its lowest part one hundred and eighteen feet above the river. Mr. Markham, who crossed it in 1855, estimated the length at ninety feet and the height at three hundred feet. Lieutenant Gibbon, who crossed it in 1857, estimated the length at three hundred and twenty-four feet and the height one hundred and fifty feet. Our measurements, however, are

exact. The height may be increased perhaps ten feet when the cables are made taut. They are five in number, twisted from the fibres of the *cabuya*, or maguey plant, and are about four inches thick. The floor is of small sticks and canes, fastened transversely with raw-hide strings. The Indians coming from Andahuaylas and other districts where the cabuya grows, generally bring a quantity of leaves with them wherewith to pay their toll. These are prepared and made into rope by the custodians of the bridge, who must be glad of some occupation in their lone and lofty eyrie.

Our baggage was carried over the bridge, and the animals were then led across one by one, loaded and started up the mountain. The space is too limited to receive more than two loaded mules at a time, and instances are known of their having been toppled over the precipice from overcrowding. We led our horses over without difficulty except in getting them on the bridge. But once fairly on the swaying structure they were as composed as if moving on the solid ground. Perhaps even to the lowest animal intelligence it must be apparent that the centre of the bridge of the Apurimac is not the place for antics, equine or asinine.

Mounted once more, we commenced our steep and difficult ascent. At one place the sheer precipice presented itself on one side, and a vertical wall on the other; next it was a scramble up a ladder of stairs, partly cut in the rock and partly built up with stones against it; then a sudden turn, with a parapet built around it in a semicircle, to prevent descending animals from being carried into the abyss below by their own momentum. Our cargo-mules toiled up painfully above us, stopping every few steps to breathe, while the muleteers braced themselves against their haunches to afford them some support and rest.

We had scarcely reached half-way to the mouth of the tunnel, which enters the mountain at the base of a vast vertical mass of rock, when our attention was arrested by the shouts of our men and a commotion among the animals above us. It was occasioned by a descending train of loaded mules, just plunging out of the black throat of the tunnel. The mountain mule always seeks to take the wall of the animal it meets, being perfectly aware of the danger of trying to pass on the outer side of the pathway; and it sometimes happens that neither will give way under any amount of persuasion or blows. The muleteers have to unload the animals, which may then be got past each other. A similar difficulty occurred now, and the conductor of the advancing train hurried down to warn us to dismount and seek the widest part of the path, or some nook by its side, and there await the passage of his mules. He had hardly done speaking when we saw one of our own mules, loaded with our trunks, come plunging down the narrow zigzagging way, evidently in fright, followed wildly by its driver. Just before reaching the place where we stood, the animal fell, going literally heels over head, and would have been carried over the little platform of rock into the river had not the master of the descending train caught the falling mule by its foreleg, and in this way saved it from tumbling over. He at once placed his whole weight on its ears, thus preventing it from struggling, and thus obviating its destruction, while we detached its cargo. A foot farther, and the mule would inevitably have been lost.

It was with no little satisfaction that we saw the last mule of the train pass us, and resumed our ascent. We found the tunnel a roomy one, two or three hundred yards in length, with openings from the face of the precipice for the admission of light and air. Through these we caught brief

glimpses of the grand and solemn mountains on the opposite side of the cañon, and through them came in also, hoarse and sullen, the deep voice of the river. I am uncertain as to how far this tunnel may be ascribed to the Incas, but feel sure that their bridge across the Apurimac was at precisely the same point with the present one. We were fully two hours in ascending the steeps, and reached the high mountain-circled plain in which stands the straggling town of Curahuasi, a well-watered village buried among trees and shrubbery.

INDEX.

		PAGE
A Fine Scenic Route	HENRY T. FINCK	31
Amazon and Madeira Rivers, Forests of the	FRANZ KELLER	200
Andes, Monarchs of the	JAMES ORTON	251
Animals of British Guiana	C. BARRINGTON BROWN	169
Ants and Monkeys, Brazilian	HENRY W. BATES	240
BACON, ALFRED TERRY	Country of the Cliff-Dwellers	59
BATES HENRY W.	Brazilian Ants and Monkeys	240
Besieged by Peccaries	JAMES W. WELLS	219
Big Trees, Lake Tahoe and the	A. H. TEVIS	68
BRACE, CHARLES LORING	Mariposa Grove and Yosemite Valley	88
Brazilian Ants and Monkeys	HENRY W. BATES	240
British Guiana, Animals of	C. BARRINGTON BROWN	169
BROWN, C. BARRINGTON	Animals of British Guiana	169
BUTLER, W. F.	Winnipeg Lake and River	21
Canoe- and Camp-Life on the Madeira	FRANZ KELLER	212
Chicago, New York, Washington	OLIVER H. G. LEIGH	5
Chinese Quarter in San Francisco	HELEN HUNT JACKSON	78
Cliff-Dwellers, Country of the	ALFRED TERRY BACON	59
Country of the Cliff-Dwellers	ALFRED TERRY BACON	59
Destruction of San Salvador	CARL SCHERZER	137
FINCK, HENRY T	A Fine Scenic Route	31
Forests of the Amazon and Madeira Rivers	FRANZ KELLER	200
FREMONT, JOHN C.	South Pass and Fremont's Peak	42
Fremont's Peak, South Pass and	JOHN C. FREMONT	42
FROEBEL, JULIUS	Route of the Nicaragua Canal	130
FROUDE, JAMES ANTHONY	Scenes in Trinidad and Jamaica	145
HAYDEN, FERDINAND V.	In the Yellowstone Park	49
HUMBOLDT, ALEXANDER VON	Life and Scenery in Venezuela	179
Inca High-Roads and Bridges	E. GEORGE SQUIER	261
In the Yellowstone Park	FERDINAND V. HAYDEN	49
JACKSON, HELEN HUNT	Chinese Quarter in San Francisco	78
Jamaica, Scenes in Trinidad and	JAMES ANTHONY FROUDE	145
KELLER, FRANZ	Forests of the Amazon and Madeira Rivers	200
KELLER, FRANZ	Canoe- and Camp-Life on the Madeira	212
KINGSLEY, CHARLES	The High Woods of Trinidad	157
Lake Tahoe and the Big Trees	A. H. TEVIS	68
LEIGH, OLIVER H. G.	New York, Washington, Chicago	5

		PAGE
Life and Scenery in Venezuela	ALEXANDER VON HUMBOLDT	179
Llaneros of Venezuela, The	RAMON PAEZ	190
Madeira, Canoe- and Camp-Life on the	FRANZ KELLER	212
Mariposa Grove and Yosemite Valley	CHARLES LORING BRACE	88
Mexico, A Sportsman's Experience in	SIR ROSE LAMBERT PRICE	99
Mexican Lowlands, Scenery of the	FELIX L. OSWALD	108
Monarchs of the Andes	JAMES ORTON	251
Monkeys, Brazilian Ants and	HENRY W. BATES	240
New York, Washington, Chicago	OLIVER H. G. LEIGH	5
Nicaragua Canal, Route of the	JULIUS FROEBEL	130
ORTON, JAMES	Monarchs of the Andes	251
OSWALD, FELIX L.	Scenery of the Mexican Lowlands	108
PAEZ, RAMON	The Llaneros of Venezuela	190
Peccaries, Besieged by	JAMES W. WELLS	219
Perils of Travel	IDA PFEIFFER	232
PFEIFFER, IDA	Perils of Travel	232
PRICE, SIR ROSE LAMBERT	A Sportsman's Experience in Mexico	99
Route of the Nicaragua Canal	JULIUS FROEBEL	130
Ruins of Yucatan, Among the	JOHN L. STEPHENS	119
San Francisco, Chinese Quarter in	HELEN HUNT JACKSON	78
San Salvador, Destruction of	CARL SCHERZER	137
Scenery of the Mexican Lowlands	FELIX L. OSWALD	108
Scenes in Trinidad and Jamaica	JAMES ANTHONY FROUDE	145
SCHERZER, CARL	Destruction of San Salvador	137
South Pass and Fremont's Peak	JOHN C. FREMONT	42
Sportsman's Experience in Mexico	SIR ROSE LAMBERT PRICE	99
SQUIER, E. GEORGE	Inca High-Roads and Bridges	261
STEPHENS, JOHN L	Among the Ruins of Yucatan	119
TEVIS, A. H	Lake Tahoe and the Big Trees	68
Travel, Perils of	IDA PFEIFFER	232
Trinidad, The High Woods of	CHARLES KINGSLEY	157
Trinidad and Jamaica, Scenes in	JAMES ANTHONY FROUDE	145
Venezuela, Life and Scenery in	ALEXANDER VON HUMBOLDT	179
Venezuela, The Llaneros of	RAMON PAEZ	190
Washington, New York, Chicago	OLIVER H. G. LEIGH	5
WELLS, JAMES W.	Besieged by Peccaries	219
Winnipeg Lake and River	BUTLER, W. F.	21
Woods of Trinidad, The High	CHARLES KINGSLEY	157
Yellowstone Park, In the	FERDINAND V. HAYDEN	49
Yosemite Valley, Mariposa Grove and	CHARLES LORING BRACE	88
Yucatan, Among the Ruins of	JOHN L. STEPHENS	119

M311759